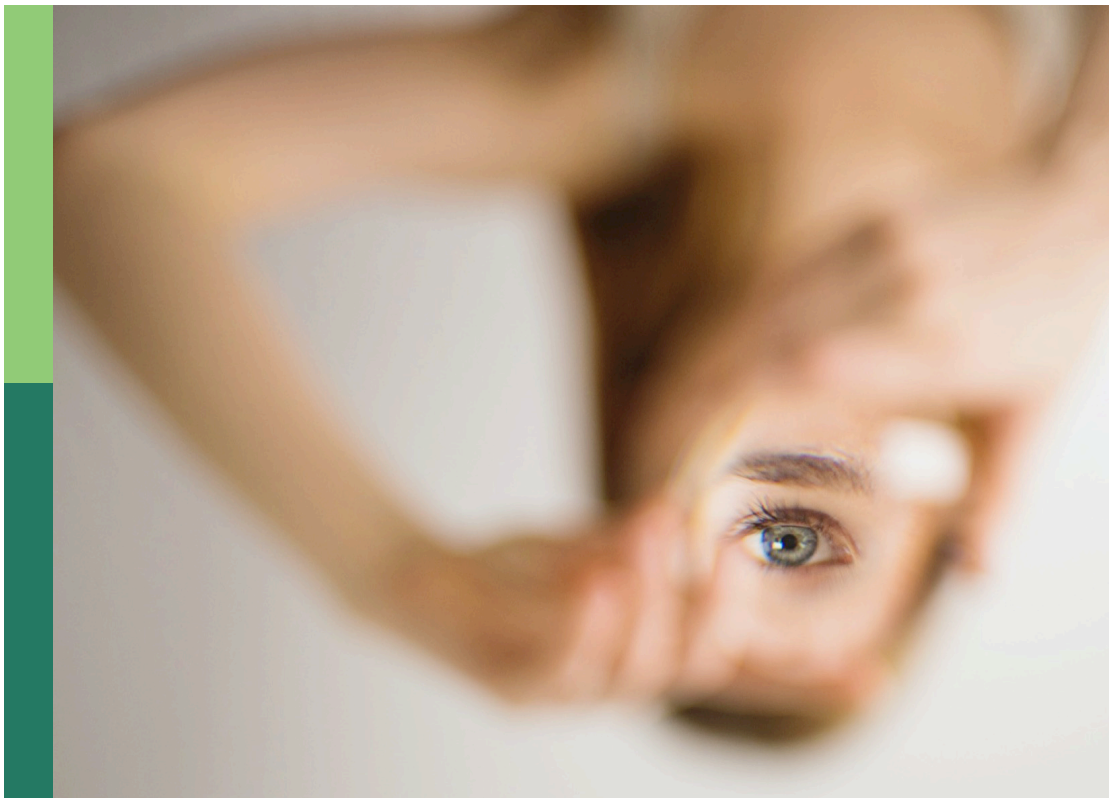
frontiers | Research Topics

Social capital and well-being of teachers and principals: Social support and beyond

Edited by
Simon Beausaert and Eva Kyndt

Published in
Frontiers in Psychology



FRONTIERS EBOOK COPYRIGHT STATEMENT

The copyright in the text of individual articles in this ebook is the property of their respective authors or their respective institutions or funders. The copyright in graphics and images within each article may be subject to copyright of other parties. In both cases this is subject to a license granted to Frontiers.

The compilation of articles constituting this ebook is the property of Frontiers.

Each article within this ebook, and the ebook itself, are published under the most recent version of the Creative Commons CC-BY licence. The version current at the date of publication of this ebook is CC-BY 4.0. If the CC-BY licence is updated, the licence granted by Frontiers is automatically updated to the new version.

When exercising any right under the CC-BY licence, Frontiers must be attributed as the original publisher of the article or ebook, as applicable.

Authors have the responsibility of ensuring that any graphics or other materials which are the property of others may be included in the CC-BY licence, but this should be checked before relying on the CC-BY licence to reproduce those materials. Any copyright notices relating to those materials must be complied with.

Copyright and source acknowledgement notices may not be removed and must be displayed in any copy, derivative work or partial copy which includes the elements in question.

All copyright, and all rights therein, are protected by national and international copyright laws. The above represents a summary only. For further information please read Frontiers' Conditions for Website Use and Copyright Statement, and the applicable CC-BY licence.

ISSN 1664-8714
ISBN 978-2-83251-400-9
DOI 10.3389/978-2-83251-400-9

About Frontiers

Frontiers is more than just an open access publisher of scholarly articles: it is a pioneering approach to the world of academia, radically improving the way scholarly research is managed. The grand vision of Frontiers is a world where all people have an equal opportunity to seek, share and generate knowledge. Frontiers provides immediate and permanent online open access to all its publications, but this alone is not enough to realize our grand goals.

Frontiers journal series

The Frontiers journal series is a multi-tier and interdisciplinary set of open-access, online journals, promising a paradigm shift from the current review, selection and dissemination processes in academic publishing. All Frontiers journals are driven by researchers for researchers; therefore, they constitute a service to the scholarly community. At the same time, the *Frontiers journal series* operates on a revolutionary invention, the tiered publishing system, initially addressing specific communities of scholars, and gradually climbing up to broader public understanding, thus serving the interests of the lay society, too.

Dedication to quality

Each Frontiers article is a landmark of the highest quality, thanks to genuinely collaborative interactions between authors and review editors, who include some of the world's best academicians. Research must be certified by peers before entering a stream of knowledge that may eventually reach the public - and shape society; therefore, Frontiers only applies the most rigorous and unbiased reviews. Frontiers revolutionizes research publishing by freely delivering the most outstanding research, evaluated with no bias from both the academic and social point of view. By applying the most advanced information technologies, Frontiers is catapulting scholarly publishing into a new generation.

What are Frontiers Research Topics?

Frontiers Research Topics are very popular trademarks of the *Frontiers journals series*: they are collections of at least ten articles, all centered on a particular subject. With their unique mix of varied contributions from Original Research to Review Articles, Frontiers Research Topics unify the most influential researchers, the latest key findings and historical advances in a hot research area.

Find out more on how to host your own Frontiers Research Topic or contribute to one as an author by contacting the Frontiers editorial office: frontiersin.org/about/contact

Social capital and well-being of teachers and principals: Social support and beyond

Topic editors

Simon Beausaert — Maastricht University, Netherlands

Eva Kyndt — Swinburne University of Technology, Australia

Citation

Beausaert, S., Kyndt, E., eds. (2023). *Social capital and well-being of teachers and principals: Social support and beyond*. Lausanne: Frontiers Media SA.

doi: 10.3389/978-2-83251-400-9

Table of contents

frontiers | Frontiers in Psychology

TYPE Editorial
PUBLISHED 09 January 2023
DOI 10.3389/fpsyg.2022.1127740

Check for updates

OPEN ACCESS

EDITED AND REVIEWED BY
Pablo Fernández-Berrocal,
University of Malaga, Spain

*CORRESPONDENCE
Simon Beausaert
✉ s.beausaert@maastrichtuniversity.nl

SPECIALTY SECTION
This article was submitted to Organizational Psychology, a section of the journal Frontiers in Psychology

RECEIVED 19 December 2022
ACCEPTED 28 December 2022
PUBLISHED 09 January 2023

CITATION
Beausaert S and Kyndt E (2023) Editorial: Social capital and wellbeing of teachers and principals: Social support and beyond.
Front. Psychol. 13:1127740.
doi: 10.3389/fpsyg.2022.1127740

COPYRIGHT
© 2023 Beausaert and Kyndt. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Editorial: Social capital and wellbeing of teachers and principals: Social support and beyond

Simon Beausaert[1]* and Eva Kyndt[2]

[1]Department for Educational Research and Development, Maastricht University, Maastricht, Netherlands, [2]Centre for Transformative Innovation, Swinburne University of Technology, Hawthorn, VIC, Australia

KEYWORDS

social capital, wellbeing, teacher, principal, social support

Editorial on the Research Topic
Social capital and wellbeing of teachers and principals: Social support and beyond

Teachers and principals are increasingly required to fulfill multiple roles (i.e., teacher, coach, manager, administrator, etc.) as societal expectations for education keep growing. In addition, the demand for accountability (i.e., through centralized exams, etc.) keeps growing (Phillips and Sen, 2011). As job demands increase, teachers and principals are also increasingly dependent on decisions of central administrators—decisions they do not always agree with—which might give them the feeling they are not in control. The combination of increased demands and reduced decision latitude is putting their wellbeing at risk (Schaufeli and Taris, 2014).

The threat to teachers and principals' wellbeing is worrisome in itself but also likely to have consequences for effective teaching and student learning. Prior research has argued that principals are one of the key elements contributing to teacher success and, which are in turn the main driver of student achievement (Leithwood et al., 2012; Ni et al., 2018). Fortunately, the wellbeing of both principals and teachers is getting more attention from policy makers and broader educational leadership (Sahlberg, 2015).

There is a large body of research on teacher wellbeing. However, prior research is skewed toward individual attributes and contextual factors, often disregarding the complex nature of individuals being embedded in networks of interrelationships. These networks provide both affordances and constraints, which are the breeding ground for social contagion processes, which can foster positive or negative spirals (Meredith et al., 2020).

In response, this Research Topic focuses on the role of social networks and social capital for teacher wellbeing. Social capital refers to "the actual and potential resources embedded in relationships among actors" (Leana and Pil, 2006, p. 353). In general, different forms of social capital have been distinguished, based on the type of relationships formed, namely internal or external to the organization or school,

or between people with the same or different formal power and/or authority. These relationships know a certain strength and might involve instrumental of personal relationships, which are more or less frequent and have various levels of trust embedded in them (Nahapiet and Ghoshal, 1998).

There seems to be a growing consensus that the social capital of teachers and principals might buffer against the high demands put on them and thus promote their wellbeing (Bauer et al., 2019). Although social support for teachers and principals and its relationship with their wellbeing has been studied a lot (e.g., Greenglass et al., 2020), social capital goes further than feeling socially supported. Recent research has for example shown that burnout is contagious through a variety of social interactions (Kalish et al., 2015; Meredith et al., 2020). This network effect was demonstrated even after controlling for traditional predictors such as workload and autonomy (Bakker et al., 2005).

This Research Topic aims to provide the reader an understanding of the complexity, depth, and variety in the relatively nascent research field of social capital for teacher and principal wellbeing. As such, it comprises articles with different perspectives on social capital, different operationalization's of wellbeing, different levels of education, and different methodologies.

In terms of the different perspectives on social capital, Coppe et al. conceptually clarified the meaning of the term social capital, keeping in mind previous teacher research, arguing for making a distinction between individual and collective social capital. The different empirical operationalization's that were used included social support for learning through learning communities (Gast et al.), manager support (Pöysä et al.; Gearhart et al.), job support (Li et al.), climate and administrative support, and facilities, general social support (Froehlich et al.), brokerage roles (Rechsteiner et al.), or the network structure of interpersonal relationships (Aboutalebi Karkavandi et al.).

Regarding wellbeing, the majority of selected studies focus directly on wellbeing using measures such as general wellbeing (Panadero et al.), work engagement (Li et al.), job stress (Pöysä et al.), emotional exhaustion, and burnout (Aboutalebi Karkavandi et al.). Other focused on interventions designed to support teachers' wellbeing such as teachers' engagement in formal and informal stress management interventions (Gearhart et al.), undertaking professional development activities for occupational wellbeing (Gast et al.) or social support interventions for newly qualified teachers (Froehlich et al.). In addition, within the selection of articles, the studies of Panadero et al., Pöysä et al., and Froehlich et al. paid specific attention to the role of emergency remote teaching during the COVID-19 pandemic.

Furthermore, this Research Topic demonstrates the variety in methodological approaches in the field. Quantitative (e.g., Rechsteiner et al.), qualitative (e.g., Gast et al.), and mixed methods (e.g., Froehlich et al.) all contribute to understanding this complex Research Topic. We want to highlight the studies of Aboutalebi Karkavandi et al. and Rechsteiner et al. who both collected social network data. Aboutalebi Karkavandi et al. specifically focused on the relation between different types and structures of interpersonal networks and burnout. Rechsteiner et al. specifically studied the role of being in a brokerage position, the degree to which a person occupies a bridging position between disconnected others, for wellbeing.

Finally, as mentioned, the teachers and principals in the samples under study were working across various levels of education: kindergarten (e.g., Li et al.), primary schools (e.g., Rechsteiner et al.), secondary schools (e.g., Aboutalebi Karkavandi et al.), and higher education (e.g., Gast et al.).

Author contributions

SB and EK: writing and editing. Both authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

Bakker, A. B., Le Blanc, P. M., and Schaufeli, W. B. (2005). Burnout contagion among intensive care nurses. *J. Adv. Nurs.* 51, 276–287. doi: 10.1111/j.1365-2648.2005.03494.x

Bauer, S. C., Silver, L., and Schwartzer, J. (2019). The impact of isolation on new principals' persistence: Evidence from a southern US state. *Educ. Manag. Admin. Leadersh.* 47, 383–399. doi: 10.1177/1741143217739359

Greenglass, E. R., Fiksenbaum, L., and Burke, R. J. (2020). "The relationship between social support and burnout over time in teachers," in *Occupational Stress*, ed R. Crandall (Boca Raton, FL: CRC Press), 239–248. doi: 10.1201/9781003072430-21

Kalish, Y., Luria, G., Toker, S., and Westman, M. (2015). Till stress do us part: On the interplay between perceived stress and communication network dynamics. *J. Appl. Psychol.* 100, 1737–1751. doi: 10.1037/apl0000023

Leana, C. R., and Pil, F. K. (2006). Social capital and organizational performance: Evidence from urban public schools. *Org. Sci.* 17, 353–366. doi: 10.1287/orsc.1060.0191

Leithwood, K. A., Louis, K. S., and Anderson, S. E. (2012). *Linking Leadership to Student Learning*. San Francisco, CA: Jossey-Bass.

Meredith, C., Schaufeli, W., Struyve, C., Vandecandelaere, M., Gielen, S., and Kyndt, E. (2020). 'Contagion' of burnout among teachers: A social network approach. *J. Occup. Org. Psychol.* 93, 328–352. doi: 10.1111/joop.12296

Nahapiet, J., and Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Acad. Manag. Rev.* 23, 242–266. doi: 10.2307/259373

Ni, Y., Yan, R., and Pounder, D. (2018). Collective leadership: Principals' decision influence and the supportive or inhibiting decision influence of other stakeholders. *Educ. Admin. Quart.* 54, 216–248. doi: 10.1177/0013161X17723427

Phillips, S., and Sen, D. (2011). "Stress in head teachers," in *Handbook of Stress in the Occupations*, eds J. Langan-Fox and C. L. Cooper (Cheltenham: Edward Elgar), 177–201. doi: 10.4337/9780857931153.00028

Sahlberg, P. (2015). *Finnish Lessons 2.0: What Can the World Learn From Educational Change in Finland?* New York, NY: Teachers College Press.

Schaufeli, W. B., and Taris, T. W. (2014). "A critical review of the job demands-resources model: Implications for improving work and health," in *Bridging Occupational, Organizational and Public Health*, eds G. F. Bauer and O. Hämmig (Dordrecht: Springer), 4. doi: 10.1007/978-94-007-5640-3_4

frontiers in Psychology

ORIGINAL RESEARCH
published: 25 November 2021
doi: 10.3389/fpsyg.2021.746123

Occupational Well-Being in Beginning Early Childhood Educators of Hong Kong and the Prediction of Job-Related Factors: Variable-Centered and Person-Centered Approaches

Jian-Bin Li[1], An Yang[2], Rui Zhang[3,4], Tuen Yung Leung[5] and Zhouxing Li[6]*

[1] The Education University of Hong Kong, Tai Po, Hong Kong SAR, China, [2] Guangdong University of Foreign Studies, Guangzhou, China, [3] Department of Psychology, Guangzhou University, Guangzhou, China, [4] University College London, London, United Kingdom, [5] Caritas Institute of Higher Education, Hong Kong, Hong Kong SAR, China, [6] Guangdong University of Education, Guangzhou, China

OPEN ACCESS

Edited by:
Simon Beausaert, Maastricht University, Netherlands

Reviewed by:
Abel Toledano-González, University of Castilla-La Mancha, Spain
Wing Yee Lo, Woosong University, South Korea
Therese Grohnert, Maastricht University, Netherlands

***Correspondence:**
Jian-Bin Li
lijianbin@eduhk.hk

Specialty section:
This article was submitted to Organizational Psychology, a section of the journal Frontiers in Psychology

Received: *23 July 2021*
Accepted: *26 October 2021*
Published: *25 November 2021*

Citation:
Li J-B, Yang A, Zhang R, Leung TY and Li Z (2021) Occupational Well-Being in Beginning Early Childhood Educators of Hong Kong and the Prediction of Job-Related Factors: Variable-Centered and Person-Centered Approaches. Front. Psychol. 12:746123. doi: 10.3389/fpsyg.2021.746123

The occupational well-being (OWB) of early childhood educators (ECEs) play a crucial role in their job performance, the development of a child, and the operation of early childhood education sectors. OWB of ECEs has been an increasing concern in recent years and this concern might be particularly salient for beginning ECEs given the multiple adaptive changes and challenges they encounter during the transition from training to teaching. However, research on the beginning ECEs' OWB has been scarce. In this study, we employed both variable-centered and person-centered approaches to explore OWB and examined job demands and resources as predictors in 117 Hong Kong beginning ECEs (113 females, M_{age} = 21.71 years). They first reported job demands (i.e., class size, working hours, dealing with children with special education needs) and job resources (i.e., salary and job support) at the end of the first month of the fall semester upon working as in-service teachers. They then reported on four OWB variables (i.e., job satisfaction, work engagement, job stress, and job burnout) at the beginning of the spring semester. Results of the variable-centered analysis revealed that beginning ECEs reported medium or above-medium levels on the positive OWB indicators and medium or below-medium levels on the negative OWB indicators. Regression analysis found that despite some exceptions, job demands and job resources negatively (positively) and positively (negatively) predicted positive (negative) OWB indicators, respectively. Results of person-centered analysis suggested that the complex pattern of different OWB indicators could be categorized into two OWB profiles (*medium well-being* vs. *relatively weak well-being – emotional exhaustion*). Results of regression analysis showed that beginning ECEs with higher

job demands were less likely, whereas those with more job resources were more likely, to be assigned to the medium well-being profile. These results inform *which* leverage points could be targeted to enhance a specific OWB indicator and identify *who* would be in dire need to enhance their OWB at the very beginning of their teaching career.

Keywords: professional well-being, job demands, job resources, transition, JD-R model, person-oriented approach, variable-oriented approach, kindergarten teachers

INTRODUCTION

There is an increasing concern for the occupational well-being (OWB) of early childhood educators (ECEs) in recent years around the globe (Hall-Kenyon et al., 2014; Cumming, 2017). This is all the more important because a positive OWB is associated with a range of desirable consequences, such as better job performance, more capacity to provide quality education and supportive classroom climate, and stronger intention to stay in the early childhood education (ECE) sector (Jeon et al., 2019; Penttinen et al., 2020; Schaack et al., 2020; Sönmez and Betül Kolaşınlı, 2020; Li et al., 2021), whereas the nature of the job itself (e.g., interactions with children, handling challenging behavior of children) entails numerous challenges and demands that often put OWB of ECEs at risk (Whitaker et al., 2015 Gu et al., 2020). Prior research has examined OWB of ECEs and its associated predictors, revealing that sufficient job resources (e.g., job support) and few job demands (e.g., long working hours) are linked with a positive OWB (Cheng and Chen, 2011; Li et al., 2020; Schaack et al., 2020). Although the existing literature is informative, most of them are variable-centered and may not reflect the full picture of OWB of ECEs because, in reality, employees may simultaneously endorse seemingly contradictory measures of OWB, such as burnout and engagement (Moeller et al., 2018; Salmela-Aro et al., 2019). Besides, most of the existing studies are conducted among veteran ECEs or ECEs with at least several years of teaching experience, but much less is focused on beginning ECEs. Understanding the OWB of beginning ECEs is important because novice teachers are likely to experience "adaptive shocks" that may be threats to their OWB during the transition from training to teaching (Chaaban and Du, 2017). For instance, prior research has suggested that compared to veteran teachers, beginning teachers experience more problems in classroom management, are less satisfied with the salary, and may over time want to leave the job (Chaaban and Du, 2017; Jones et al., 2019; Schaack et al., 2020). To bridge the said gaps, the aim of this study is twofold. First, we employ both variable and person-centered approaches to examine OWB of beginning ECEs. Second, we examine the extent to which the job-related factors relevant to the ECE settings predict subsequent OWB from a job demands-resources (JD-R) perspective (Bakker and Demerouti, 2014). The results are expected to contribute to the literature of OWB of ECEs.

Early Childhood Educators in Hong Kong and Beginning Early Childhood Educators

This study is specifically focused on beginning ECEs in Hong Kong. Over the past two decades, the Hong Kong government has implemented several reformations in the ECE system to develop one of the best, most competitive kindergarten education policies in the world, such as increasing the financial investment in kindergarten education (c.f. Wong and Rao, 2015). In Hong Kong, there are more than 1,000 kindergartens and kindergartens-cum-childcare centers (Education Bureau, 2021), and nearly all the children aged 3 to 6 attend preschool programs even though ECE is not compulsory (Audit Commission, 2013). According to Wong and Rao (2015), an important reason for such a high enrollment rate in ECE is because the education systems in Hong Kong is highly competitive, wherein examinations are heavily emphasized, and parents typically perceive ECE as a means to prepare their children to be ready for a primary school in an early stage. Other reasons also include a large number of dual-earning families, the extensive and efficient public transport system, and above all, the implementation of various funding schemes which ensure that no child is deprived of preschool education because of financial issues (Rao, 2010).

To promote learning diversity, all-round development, and better alignment with primary and secondary education of children, the Education Bureau has implemented the Free Quality Kindergarten Education Schemes since 2017 to provide even more affordable and better quality of education to children through improving the school environment and enhancing the professionalism of teachers (Education Bureau, 2017). As of 2021, about 73% of the kindergartens in Hong Kong have joined the scheme (Education Bureau, 2021). Although the professional skills and job performance of ECEs are greatly emphasized in Hong Kong, their OWB has received much less attention. This is concerning as a recent survey conducted with 1,255 Hong Kong ECEs (referred to teachers in kindergartens-cum-childcare centers) found that many ECEs had experienced alarming issues [e.g., 82% reporting more than 50 working hours per week; 53% reporting increase in administrative work since the implementation of the scheme; 65% reporting the need to deal with children with special education needs (SEN); and 71% reporting incommensurate salary]. Meanwhile, many of them hoped to have more support, resources, staffing, and commensurate salary (Hong Kong Federation of Education Workers, 2019).

This study is contextualized in the developmental stage where young people transition from higher education to work. To register as a kindergarten teacher in Hong Kong, students need to complete a recognized training program, such as a 2-year full-time higher diploma in ECE or a four or 5-year full-time Bachelor of Education in ECE. Graduates of the higher diploma and Bachelor of Education (full-time) typically fall within the emerging adulthood (aged 18–25 years, Arnett, 2000) as these students are usually admitted to university right after high school. These fresh graduates not only need to solve multiple developmental tasks relevant to emerging adulthood, such as exploring adult identity, becoming financially independent, and developing romantic relationships (Arnett, 2000), but they are also required to navigate many adaptive changes after serving as beginning teachers, such as role transition, inexperience, and unfamiliarity with the new organization (Chaaban and Du, 2017; Zhou et al., 2020). As such, the first year of teaching is often filled with struggling and successfully handling the adaptive changes would result in enjoyment, engagement, and satisfaction, whereas failure to do so leads to negative emotions, self-doubts, dissatisfaction, and burnout (Tait, 2008) and further causes cascade of inefficacy and attrition within the first few years of teaching (Tiplic et al., 2015; Harmsen et al., 2018). Taken together, understanding OWB among Hong Kong beginning ECEs is paramount and necessary.

Occupational Well-Being Among Early Childhood Educators

The occupational well-being of teachers can be defined as the "positive evaluation of various aspects of one's job, including affective, motivational, behavioral, cognitive, and psychosomatic dimensions" (Van Horn et al., 2004, p. 366). Although little research has exhausted occupational well-being elements of ECEs so far, existing literature has commonly agreed that OWB of ECEs is a broad construct involving both positive and negative indicators and that *job satisfaction*, *work engagement*, *job stress*, and *job burnout* could be the four most representative elements (Hall-Kenyon et al., 2014; Cumming, 2017; Penttinen et al., 2020; Peele and Wolf, 2021). These elements are consistent with the core ideas of positive psychology that the optimal well-being of an individual should be reflected by both the absence of illness and the presence of virtues (Seligman and Csikszentmihalyi, 2000). These elements also align with the two approaches of well-being: the hedonic approach which focuses on pleasure attainment and pain avoidance and the eudaimonic approach which focuses on the degree to which a person is fully functioning (Ryan and Deci, 2001). ECEs with a positive OWB are those who score high on positive and low on negative indicators. By contrast, ECEs with a negative OWB refer to those who score low on positive and high on negative indicators.

In this study, *job satisfaction* refers to the evaluative judgments that teachers make about their work (Corbell et al., 2010). Job satisfaction of teachers may result from both intrinsic and extrinsic sources, but researchers suggest that compared to measuring intrinsic and extrinsic satisfaction separately, an overall evaluation of job satisfaction may capture a more objective sense of satisfaction because this would reduce the measurement bias due to differential evaluation of the same contextual factor at various time points (Chaaban and Du, 2017). Regarding *work engagement*, it refers to a positive, fulfilling, and work-related state of mind featured by vigor, dedication, and absorption (Schaufeli et al., 2002). According to Schaufeli et al. (p. 74–75), *vigor* is featured by "high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties." *Dedication* is featured by "a sense of significance, enthusiasm, inspiration, pride, and challenge." *Absorption* is featured by "being fully concentrated and deeply engrossed in one's work, whereby times passes quickly and one has difficulties with detaching oneself from work." *Job stress* refers to work-related demands directly interfering with the effort of teachers, depleting time, and inducing unpleasant physical and emotional reactions (Blase, 1982). Job stress of ECEs may arise from a number of sources (e.g., time management, professional distress) and can be manifested in terms of emotional, behavioral, and somatic symptoms (Tsai et al., 2006). *Job burnout* is a concept relevant to job stress and it is a prolonged response to chronic emotional and interpersonal stressors on the job (Maslach et al., 2001). Job burnout is characterized by three key dimensions, namely, exhaustion, cynicism, and inefficacy. According to Maslach et al. (2001), *exhaustion* is the stress dimension of burnout and refers to feelings of being overextended and depleted emotional and physical resources of an individual. *Cynicism* (or depersonalization) is the interpersonal context dimension of burnout and refers to a negative, callous, or excessively detached response to various aspects of the job, and *reduced efficacy* (or low accomplishment) is the self-evaluation dimension of burnout and refers to feelings of incompetence and a lack of achievement and productivity at work. Noticeably, exhaustion and cynicism are the two opposite dimensions of vigor and dedication, respectively (Schaufeli et al., 2002). Burnout is often related to the intention of teachers to quit the job or the profession (Leung and Lee, 2006; Skaalvik and Skaalvik, 2011). Prior studies have suggested that these indicators are typically interrelated among one another (Schaufeli et al., 2006; Gu et al., 2020; Penttinen et al., 2020; Li et al., 2021). For instance, Yeşil Dağli (2012) found that job satisfaction was negatively related to job burnout among United States public kindergarten teachers. Similarly, a study by Li et al. (2020) conducted among mainland Chinese preschool teachers discovered that job satisfaction and job stress were related to a lower and higher likelihood of job burnout, respectively. Moreover, the study by Li et al. (2021) conducted among Hong Kong beginning kindergarten teachers found that work engagement was negatively related to job stress.

The aforementioned studies relied on a variable-centered approach. However, this approach does not entirely reflect the reality because employees may simultaneously report highly on both positive and negative OWB indicators (Moeller et al., 2018; Salmela-Aro et al., 2019). To reveal the complex pattern of many variables, the person-centered approach is suitable and may complement the variable-centered approach (Howard and Hoffman, 2018). According to Magnusson (2003), variable and person-centered approaches have their

own focuses, assumptions, and statistical models. Specifically, the variable-centered approach focuses on the position of an individual on the level of a variable relative to other individuals. Starting from the perspective of stimulus-response or response-response, this approach considers that position of an individual on the level of one variable is related to his/her position on the level of another variable, assuming that "the interrelations among variables studied at the group level can be used to make inferences about how the variables function within individuals" (p. 14). The analytical models of this approach (e.g., correlation, regression) are well suited for questions pertaining to the description of individual variables and to the examination of the effects of predictors on the outcome variables. By contrast, the person-centered approach focuses on the identification of subgroups of individuals who function in a similar way while taking into account many variables simultaneously, assuming that a given population is heterogeneous and causing different subgroups based on similar configuration would emerge. The analytical models of this approach (e.g., latent profile analysis, LPA) are well suited for questions pertaining to group differences in the complex patterns of a construct indicated by many different variables. This approach does not assume that the interrelation between variables in one subgroup should hold for another subgroup. In sum, with a variable-centered approach, we may examine how well a person is doing relative to others in the sample on individual variables (e.g., job satisfaction) and the strength of associations among individual variables for the whole population. With a person-centered approach, we may determine whether the sample can be categorized into qualitatively distinct subgroups considering many individual variables simultaneously and examine what factors could distinguish the memberships of subgroups and how the subgroups differ in the outcomes.

A recent review summarized that in the organizational settings, the job, organizational attitudes, and behaviors of employees often display qualitatively distinct profiles comprised of different levels of indicators and that the use of a person-centered approach may nicely identify subpopulations with different configural profiles within a population to inform theoretical development (Spurk et al., 2020). For instance, Salmela-Aro et al. (2019) used LPA to explore OWB in terms of engagement and burnout among 149 Finnish high school teachers. They identified two profiles, namely, engaged-burnout and highly engaged. This suggests that while many teachers are fully engaged in their work, they may also report symptoms of burnout at the same time. In other words, not all teachers who score high on positive indicators (e.g., work engagement) would score low on negative indicators (e.g., job burnout). Using LPA in organizational research to disclose the OWB of employees, unfortunately, is still in its infancy (Spurk et al., 2020), let alone among beginning ECEs. Hence, the first aim of this study is to employ both variable and person-centered approaches to examine beginning the OWB of ECEs.

The Role of Job Demands and Resources in the Occupational Well-Being of Beginning Early Childhood Educators

The job demands-resources (JD-R) model postulates that the OWB of employees is associated with two broad categories of factors, namely, job demands and job resources (Bakker and Demerouti, 2014). Job demands refer to various aspects of the job that require sustained physical and/or psychological effort that may lead to certain physiological and/or psychological costs, whereas job resources refer to various aspects of the job that help achieve the work goals, reduce job demands and their associated costs, and stimulate personal growth (Bakker and Demerouti, 2007). According to Bakker and Demerouti (2014), job demands exhaust the physical and psychological energy of employees and result in negative OWB. By contrast, job resources assist employees in navigating the job demands so that they can restore their energy, achieve desirable outcomes, and experience positive OWB.

Building upon the JD-R model (Bakker and Demerouti, 2014), the second aim of this study is to examine the role of different job demands and resources in predicting the OWB of Hong Kong

TABLE 1 | Means, standard deviations, and bivariate correlations between occupational well-being (OWB) indicators for the total sample.

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. T2 Class size	26.24	8.97	–											
2. T2 SEN students in class (1 = yes, 2 = no)	1.20	0.40	0.27**	–										
3. T2 Working hours	9.81	1.46	0.12	0.05	–									
4. T2 Salary	5.24	1.26	0.09	−0.04	0.56***	–								
5. T2 Job support	4.42	0.82	−0.12	−0.10	−0.04	0.10	–							
6. T3 Job satisfaction	3.45	0.58	−0.08	0.01	−0.36***	−0.06	0.62***	–						
7. T3 Work engagement: absorption	3.24	0.64	0.02	0.01	−0.11	0.13	0.36***	0.41***	–					
8. T3 Work engagement: dedication	3.57	0.61	−0.06	0.12	−0.24**	0.11	0.42***	0.53***	0.68***	–				
9. T3 Work engagement: vigor	2.99	0.64	0.07	0.10	−0.15	0.06	0.37***	0.40***	0.77***	0.72***	–			
10. T3 Job stress	2.71	0.76	0.19*	−0.12	0.42***	0.22*	−0.26**	−0.50***	−0.09	−0.24**	−0.14	–		
11. T3 Job burnout: emotional exhaustion	4.07	1.31	0.14	−0.22*	0.44***	0.20*	−0.28**	−0.55***	−0.23**	−0.38***	−0.35***	0.63***	–	
12. T3 Job burnout: reduced efficacy	2.59	0.92	0.03	−0.08	0.06	−0.12	−0.32***	−0.34***	−0.35***	−0.48***	−0.34***	0.29***	0.14	–
13. T3 Job burnout: cynicism	2.50	1.43	0.08	−0.12	0.23*	0.03	−0.30**	−0.40***	−0.15	−0.34***	−0.26***	0.47***	0.59***	0.24**

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

beginning ECEs. According to the literature (Hall-Kenyon et al., 2014; Cumming, 2017; Hong Kong Federation of Education Workers, 2019; Ji and Yue, 2020; Li et al., 2020; Schaack et al., 2020; Zhou et al., 2020), the job demands that are common to ECEs, in particular, Hong Kong ECEs, include (but are not limited to) teaching a large sized class, handling challenging behaviors of SEN students, and working long hours, etc., whereas the job resources that are common to ECEs include (but are not limited to) receiving more support from supervisors and colleagues, being rewarded with commensurate salary, a good working climate, etc. Prior studies, albeit predominately cross-sectional in nature, found that ECEs encountering more job demands and possessing fewer job resources are more prone to experience negative OWB, while ECEs with fewer demands and more job resources tend to have a positive OWB (Gong et al., 2020; Li et al., 2020; Schaack et al., 2020).

Although little is known about the situation for beginning ECEs, in learning from the JD-R model and existing findings, we believe that job demands and resources at the beginning of teaching play a critical role in subsequent OWB. According to Tait (2008), beginning teachers with fewer job demands and more job resources would be more able to handle the adaptive changes and challenges during the transition period, which may facilitate the development of positive OWB in the long run, whereas if beginning teachers encounter a great deal of job demands but receive few resources, they may have difficulties in handling the changes and challenges. In addition, if this situation continues, they may feel overwhelmed with a reduced efficacy which may further cause disengagement and even attrition. In this sense, we believe that early levels of job demand and resources would predict the later OWB of beginning ECEs.

The Current Research

In order to advance our understanding of the OWB of beginning ECEs, this study examines two questions: (1) what is the *status quo* of the OWB of Hong Kong beginning ECEs and (2) do job demands and resources predict later OWB? While the first question is exploratory in nature, we made a hypothesis for the second question. More specifically, we expected that beginning ECEs with fewer job demands and more job resources would have more positive OWB (i.e., higher levels of job satisfaction and work engagement while lower levels of job stress and job burnout). In addition, we expected that beginning ECEs with fewer job demands and more job resources would more likely be assigned as members of a more positive OWB profile. In this longitudinal study, we adopted both variable and person-centered approaches to examine the said questions, which may yield greater implications for how to enhance the OWB of beginning ECEs than the use of a single approach.

METHOD

Participants and Procedure

This study was part of a larger project that employed a three-wave longitudinal design to examine the extent to which individual factors (e.g., personality and mental health) during the training program would predict the job-related outcomes at work. At time 1 (T1), we collected data related to personality traits and mental health from students in their last semester of a 2-year, full-time early childhood education higher diploma program in the Education University of Hong Kong (N = 300, 96% females, covering 83.3% headcount of the cohort). By the time of the data collection, these students had completed qualifying internships and were expected to work in ECE sectors (e.g., kindergartens) upon graduation (not necessarily in the sectors where they did their internships). At the end of the first month of the Fall semester (time 2, T2), we followed up with the participants. Those who were working as in-service ECEs at the time of data collection were eligible to be followed up. A total of 213 participants responded to our invitation and 128 were eligible because they indicated that they were working as ECEs at the time. During the end of the fall semester and the beginning of the spring semester (time 3, T3), we again followed up with the participants. Eleven participants were excluded because they did not respond to our invitation, did not work as ECEs, or did not complete the questionnaires that measure the main variables, thus leaving 117 participants as the final sample (113 females, M_{age} = 21.71 years, SD = 3.09). Among the final sample, 111 participants were appointed as full-time kindergarten teachers and 6 as part-time kindergarten teachers, with 24 participants teaching at nursery class, 44 teaching at K1, 20 teaching at K2, and 29 teaching at K3. The average class size was 26.24 students (SD = 8.97) and the average daily working hours were 9.81 (SD = 1.46). Moreover, 21% of participants reported that they did not have SEN children in their class and 65.9% of participants earned more than HK$21,000 per month (US$1 = HK$7.8). The data reported in this study were from T2 and T3 because the questions in a study that were concerned about OWB and the prediction of job-related factors which were recruited were only at T2 and T3.

This study was reviewed and approved by the Human Research Ethical Committee of the Education University of Hong Kong (reference number: 2017-2018-0429). To collect data at T1, a research assistant approached the pre-service teachers in the classrooms and administered paper-and-pencil surveys during regular class hours. Participants were required to provide contact information (e.g., phone number and e-mail) for data matching purposes. To collect data at T2 and T3, the research assistant invited participants to join online surveys through e-mails, WhatsApp messages, and phone calls. Confidentiality was underscored across data collection and participants reserved the right to withdraw from each survey at any point. We selected the measurement moment for T1 according to the study schedule of pre-service teachers and the moments for T2 and T3 based on the study purpose (i.e., the prediction of job factors at the beginning of the semester on OWB one semester later). Participants received supermarket coupons with face values of HK$50, HK$100, and HK$150 upon completing the first, second, and third waves of the survey, respectively.

Measures

Occupational Well-Being Indicators at T3

Job satisfaction. We employed the Chinese version of the Job Satisfaction Scale (Tsui et al., 1992) to measure how much participants were satisfied with their job. We adapted this measure to the current study by replacing the word "organization" in the original items with "kindergarten" to fit the working context of participants. This scale consists of six items rated on a five-point scale (from 1 = *strongly disagree* to 5 = *strongly agree*) and a higher mean score indicates higher job satisfaction. Sample item includes "Considering everything, how satisfied are you with your current job situation." In this study, Cronbach's alpha was 0.80.

Work engagement. We employed the Chinese version of Schaufeli et al. (2002) Work Engagement Scale (Wang et al., 2015) to measure the work engagement of participants. Although this scale was not specifically designed for educators, it has been widely used in various professions, including teachers (Hakanen et al., 2006; De Stasio et al., 2019). This scale consists of seventeen items divided into three dimensions: vigor, dedication, and absorption. The vigor dimension includes six items (e.g., "At my job I feel strong and vigorous"); the dedication dimension includes five items (e.g., "I am enthusiastic about my job"); and the absorption dimension includes six items (e.g., "When I am working, I forget everything else around me"). All items are rated on a five-point scale (from 1 = *strongly disagree* to 5 = *strongly agree*), and a higher mean score of each dimension indicates stronger work engagement. In this study, the Cronbach's alpha was 0.79, 0.83, and 0.81 for the vigor, dedication, and absorption dimensions, respectively.

Work stress. We used the Teacher Stress Inventory (TSI; Fimian and Fastenau, 1990) to measure the work stress of participants. This measure was specifically designed to tap the stress of teachers. In this study, we translated the TSI into Chinese following a back-translation procedure (Van de Vijver and Hambleton, 1996). This scale lists sixteen stressors in the teaching context and participants were asked to indicate how stressed they feel for each stressor on a five-point scale (from 1 = *not stressful* to 5 = *highly stressful*). A higher mean score reflects more work stress. A sample item is "There is too much administrative paperwork in my job." In this study, Cronbach's alpha was 0.94.

Job Burnout. We employed the Chinese version of the Maslach Burnout Inventory: Educators Survey (Yuen et al., 2002) to measure the job burnout of participants. This scale was specifically designed to measure the burnout of teachers at work. This scale consists of 22 items divided into three dimensions: emotional exhaustion, cynicism, and reduced efficacy. The emotional exhaustion dimension includes nine items (e.g., "I feel used up at the end of the workday"); the cynicism dimension includes five items (e.g., "I've become more callous toward people since I took this job"); and the reduced efficacy dimension includes eight items (e.g., "I deal very effectively with the problems of my students," reverse scoring). All items are rated on a seven-point Likert-type rating scale (from 0 = *never* to 6 = *every day*). A higher mean score of each dimension indicates stronger burnout. In this study, the Cronbach's alpha was 0.90, 0.84, and 0.85 for the emotional exhaustion, cynicism, and reduced efficacy dimensions, respectively.

Job Demands and Resources at T2

We measured job demands in terms of class size, working hours per week, and whether they had SEN children in the class (coded 1 = *Yes*, 2 = *No*). In addition, we measured job resources in terms of monthly salary and job support. To measure perceived support of participants from supervisors and colleagues, we employed the Job Support Scale (Skaalvik and Skaalvik, 2011). In this study, we translated this scale into Chinese following a back-translation procedure (Van de Vijver and Hambleton, 1996). This scale includes six items rated on a six-point scale (from 1 = *strongly disagree* to 6 = *strongly agree*). A higher mean score indicates that participants perceive more job support. A sample item includes "Teachers at this school help and support each other." In this study, Cronbach's alpha was 0.92.

Data Analyses

We analyzed the data with SPSS 26.0 and Mplus 7.31 (Muthén and Muthén, 1998-2012). We first conducted attrition analyses by comparing job demands and job resources variables between those who provided complete data for this research (i.e., the complete group) and those who dropped at T3 (i.e., the attrition group). Regarding *variable-centered analyses*, we first conducted preliminary analyses (mean and standard deviations, and Pearson correlations). Then, we used multivariate regression (estimator = maximum likelihood; bootstrapping N = 5,000) to examine the extent to which T2 job demands and job resources factors predicted T3 OWB in Mplus. We simultaneously regressed all OWB indicators on job demands and resources to control for the concurrent covariance among OWB indicators. Subsequently, we used G*Power 3.1.9.7 (F-test family, linear multiple regression R^2 deviation from zero) to examine the sample size needed for 0.80 power with the obtained regression estimates. Regarding *person-centered analyses*, we first conducted LPA to explore OWB profiles using the robust maximum-likelihood estimator with robust standard errors (MLR), with scores of job satisfaction, vigor, dedication, absorption, job stress, emotional exhaustion, cynicism, and reduced efficacy as indicators. We tested the 1-profile model first, then the number of profiles was systematically increased until the best fitting model was identified. We determined the best-fitting model based on several model fit statistics: Akaike Information Criteria (AIC, Akaike, 1974), Bayesian Information Criterion (BIC, Schwarz, 1978), adjusted BIC (aBIC), Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LMRT, Lo et al., 2001), and Bootstrapped Likelihood-Ration Test (BLRT, Arminger et al., 1999). Regarding AIC, BIC, and aBIC, smaller values indicate better model fit. LMRT and BLRT evaluate the fit of a k-profile model (e.g., 3-profile model) to a k-1profile comparison model (e.g., 2-profile model), and the p-values associated with these statistics indicate whether the k-profile model ($p < 0.05$) or the k-1 profile model ($p > 0.05$) provides a better fit to the data. Moreover, the value of entropy no less than 0.6 indicates a good profile separation (Asparouhov and Muthén, 2014). In addition, we also considered the theoretical meaningfulness

of the profiles (Nylund et al., 2007) and the proportion of participants represented in the profiles (Hipp and Bauer, 2006). A rule of thumb is that no profile should contain less than 5% of the respondents (Stanley et al., 2017). Given the modest sample size, we carried out Monte Carlo simulations to examine whether the current sample size was large enough to substantially distinguish the OWB profiles (Muthén and Muthén, 2002, Muthén and Muthén, 1998-2012). To this end, we used the current estimates and variance of each indicator in each profile as the starting values in combination with three sample sizes (N = 50, 80, and 110). The estimation processes were replicated 1000 times for each sample size. If sufficient power (i.e., 0.80 or above) was achieved with the given starting values and sample size, we deemed that our current sample size (>110) was adequate to achieve sufficient power. In the last step, we examined the association between T2 job demands and resources and T3 profile memberships with the R3STEP auxiliary command after identifying the best-fitting model (Asparouhov and Muthén, 2014). As the coefficients generated by the R3STEP function are logits, we exponentiated the logits into odd ratios for interpretation.

RESULTS

Attrition Analyses

We used chi-square tests, independent t-tests, and Spearman correlations to examine the relationship between attrition group and T2 job demands and job resources. The results showed that the two groups did not significantly differ in whether there were SEN students in the class [$\chi^2(1) = 0.03$, $p = 0.854$], class size [$t(126) = -0.62$, $p = 0.540$], daily working hours [$t(126) = 0.62$, $p = 0.537$], or levels of job support [$t(126) = -0.56$, $p = 0.576$] at T2. Moreover, drop-out was also not significantly related to T2 salary ($\rho = 0.06$, $p = 0.477$). These findings suggested that our findings were not likely biased due to attrition.

Variable-Centered Analyses

Preliminary Analyses

As summarized in **Table 1**, participants overall reported medium-to-high levels of job satisfaction (3.45 out of 5) and dedication (3.57 out of 5), medium levels of absorptive work engagement (3.24 out of 5), vigorous work engagement (2.99 out of 5), and emotional exhaustion (4.07 out of 7), low-to-medium levels of total job stress (2.71 out of 5), and low levels of reduced efficacy (2.59 out of 7) and cynicism (2.50 out of 7). Regarding bivariate associations, positive indicators were positively linked with one another, so were the negative indicators, and positive indicators were negatively related to negative indicators, except for four sets of correlations (i.e., job stress and absorption, job stress and vigor, absorption and cynicism, and emotional exhaustion and reduced efficacy). Finally, T2 job demand and job resources were related to T3 OWB indicators differently. Of note, T2 job support was related to all the positive and negative OWB indicators in the expected direction at statistically significant levels.

Regression Analysis

Table 2 presents the predictive effects of T2 job demands and job resources on T3 OWB indicators. The model was saturated (i.e., chi-square = 0, RMSEA = 0, CFI and TLI = 1.00). It accounted for 48% variance of T3 job satisfaction, with longer working hours ($B = -0.13$, $SE = 0.03$, $p < 0.001$) negatively predicting this indicator and stronger job support ($B = 0.42$, $SE = 0.05$, $p < 0.001$) positively predicting the same indicator. The model accounted for 17% of the variance of T3 absorption, with higher salary ($B = 0.10$, $SE = 0.05$, $p = 0.049$) and stronger job support ($B = 0.27$, $SE = 0.07$, $p < 0.001$) positively predicting this indicator. The model accounted for 29% variance of T3 dedication, with longer working hours ($B = -0.014$, $SE = 0.04$, $p = 0.001$) negatively predicting and not having SEN students in class ($B = 0.30$, $SE = 0.12$, $p = 0.011$), higher salary ($B = 0.13$, $SE = 0.05$, $p = 0.012$), and stronger job support ($B = 0.29$, $SE = 0.09$, $p = 0.001$) positively predicting this indicator. The model accounted for 21% variance of T3 vigor, with longer working hours ($B = -0.09$, $SE = 0$, $p < 0.042$) negatively predicting and larger class size ($B = 0.01$, $SE = 0.01$, $p = 0.028$), not having SEN students in class ($B = 0.31$, $SE = 0.15$, $p = 0.033$), and stronger job support ($B = 0.29$, $SE = 0.06$, $p < 0.001$) positively predicting this indicator. The model accounted for 25% variance of T3 job stress, with longer working hours ($B = 0.19$, $SE = 0.05$, $p < 0.001$) positively predicting and stronger job support ($B = -0.21$, $SE = 0.08$, $p = 0.009$) negatively predicting this indicator. The model accounted for 31% variance of T3 emotional exhaustion, with longer working hours ($B = 0.38$, $SE = 0.09$, $p < 0.001$) positively predicting and not having SEN students in class ($B = -0.80$, $SE = 0.25$, $p = 0.001$) and stronger job support ($B = -0.42$, $SE = 0.12$, $p = 0.001$) negatively predicting this indicator. The model accounted for 14% variance of T3 reduced efficacy, with stronger job support ($B = -0.35$, $SE = 0.13$, $p = 0.006$) negatively predicting this indicator. The model accounted for 16% variance of T3 cynicism, with longer working hours ($B = 0.25$, $SE = 0.10$, $p = 0.008$) positively predicting and not having SEN students in class ($B = -0.56$, $SE = 0.24$, $p = 0.021$) and stronger job support ($B = -0.49$, $SE = 0.18$, $p = 0.006$) negatively predicting this indicator. Based on the standardized regression estimates presented in **Table 2**, we conducted power analyses in G*Power. The results suggested that the required sample size needed for 0.80 power varied across OWB indicators, ranging from at least 21 participants needed for job satisfaction to 70 for reduced efficacy. Given that our current sample was 117, we considered that the current sample size would be sufficient to achieve 0.80 power for the regression results.

Person-Centered Analyses

Occupational Well-Being Profiles Among Beginning Early Childhood Educators

As shown in **Table 3**, the results of LPA analysis suggested that the 2-profile solution described the optimal number of occupational well-being profiles. First, the 2-profile solution showed a better fit than the 1-profile solution, as indicated by significant LMRT ($p = 0.023$) and BLRT ($p < 0.001$) tests. By contrast, the 3-profile solution was not better than the 2-profile solution, as the

TABLE 2 | Regression of OWB indicators on job demands and job resources.

	T3 Job satisfaction (R^2 = 0.48)				T3 Work engagement: absorption (R^2 = 0.17)				T3 Work engagement: dedication (R^2 = 0.29)				T3 Work engagement: vigor (R^2 = 0.21)			
	B	*SE*	*p*	β	*B*	*SE*	*p*	β	*B*	*SE*	*p*	β	*B*	*SE*	*p*	β
T2 Class size	0.00	0.01	0.570	0.04	0.01	0.01	0.360	0.09	0.00	0.01	0.461	0.06	0.01	0.01	0.028	0.18
T2 SEN	0.13	0.11	0.245	0.09	0.12	0.16	0.426	0.08	0.30	0.12	0.011	0.20	0.31	0.15	0.033	0.20
T2 Working hours	−0.13	0.03	< 0.001	−0.34	−0.08	0.05	0.118	−0.19	−0.14	0.04	0.001	−0.34	−0.09	0.00	0.042	−0.20
T2 Salary	0.03	0.04	0.430	0.07	0.10	0.05	0.049	0.20	0.13	0.05	0.012	0.26	0.07	0.05	0.141	0.14
T2 Job support	0.42	0.05	< 0.001	0.59	0.27	0.07	< 0.001	0.34	0.29	0.09	0.001	0.39	0.29	0.06	< 0.001	0.37
	T3 Job stress (R^2 = 0.25)				**T3 Job burnout: emotional exhaustion (R^2 = 0.31)**				**T3 Job burnout: reduced efficacy (R^2 = 0.14)**				**T3 Job burnout: cynicism (R^2 = 0.16)**			
	B	*SE*	*p*	β	*B*	*SE*	*p*	β	*B*	*SE*	*p*	β	*B*	*SE*	*p*	β
T2 Class size	0.01	0.01	0.252	0.08	−0.00	0.01	0.966	−0.00	−0.01	0.01	0.526	−0.05	−0.00	0.01	0.862	−0.01
T2 SEN	−0.22	0.17	0.183	−0.12	−0.80	0.25	0.001	−0.25	−0.31	0.18	0.080	−0.14	−0.56	0.24	0.021	−0.16
T2 Working hours	0.19	0.05	< 0.001	0.37	0.38	0.09	< 0.001	0.43	0.08	0.07	0.249	0.12	0.025	0.10	0.008	0.26
T2 Salary	0.02	0.06	0.680	0.04	−0.01	0.09	0.890	−0.01	−0.12	0.10	0.222	−0.17	−0.11	0.09	0.248	−0.10
T2 Job support	−0.21	0.08	0.009	−0.23	−0.42	0.12	0.001	−0.26	−0.35	0.13	0.006	−0.32	−0.49	0.18	0.006	−0.28

SEN students in class (1 = yes, 2 = no).

LMRT test was not significant (p = 0.616). In addition, although the values of AIC, BIC, and aBIC decreased as the number of profiles increased, the magnitude of such decrease appeared more pronounced between the 1-profile and the 2-profile solutions than the one between the 2-profile and the 3-profile solutions. Moreover, for the 2-profile solution, no profile contained less than 5% of the respondents, whereas one of the profiles of the 3-profile solution contained less than 5% of the participants. Taken together, we selected the 2-profile solution as the final solution. This solution exhibited high entropy (i.e., 0.88) and the average posterior profile membership probability was high (i.e., 97.6% for the first and 95.4% for the second profile).

Table 4 presents the raw scores of the OWB indicators for each profile and the results of multivariate analysis of variance (MANOVA). We labeled the first profile as "*medium well-being*." This profile consisted of 71% of participants. A seeming characteristic of this profile is that the levels of all the positive indicators were above the mid-point (especially dedication), whereas the levels of all the negative indicators were below the mid-point (especially cynicism). Moreover, we labeled the second profile as "*relatively weak well-being – emotional exhaustion*." This profile consisted of 29% of participants. The beginning ECEs assigned to this profile showed two characteristics: (1) the levels of all the positive indicators were a bit lower than, or close to, the mid-point and (2) the levels of stress were slightly higher than the mid-point, whereas the levels of exhaustion were seemingly above the mid-point. Of note, this group of participants also had relatively low reduced efficacy and cynicism.

We conducted a MANOVA analysis to examine whether the levels of the OWB indicators were quantitively different between the two profiles. The results indicated a statistically significant difference in the multivariate test, Wilk's λ = 0.338, $F(8, 108) = 26.40$, $p < 0.001$, partial $\eta^2 = 0.66$. Follow-up examination of the between-subject effects revealed significant main effects. Compared to beginning ECEs assigned to the "*relatively weak well-being – emotional exhaustion*" profile, those assigned to the "*medium well-being*" profile reported significantly higher job satisfaction, absorption, dedication, and vigor, but lower job stress, emotional exhaustion, reduced efficacy, and cynicism.

Monte Carlo Analysis

The results of power analyses using Monte Carlo simulation found that with the current estimates as the starting values, the statistical power for each indicator and its variance ranged from 0.922 to 1.000, from 0.968 to 1.000, and from 0.986 to 1.000 when the number of observations was set to 50, 80, and 110, respectively. These statistical powers were larger than the conventional value (i.e., 0.80). Given that our sample size was 117, which was larger than 110, we deemed that our sample size was large enough to achieve adequate statistical power in distinguishing the two OWB profiles.

The Role of Job Demands and Resources in Occupational Well-Being Profiles

The results of the prediction of T2 job demands and resources on T3 OWB profiles are summarized in **Table 5**. As shown, all job demands and resources variables at T2 significantly predicted different OWB profiles at T3, except for class size. These findings suggested that relative to the "*relatively weak well-being – emotional exhaustion*" profile, one unit increase in working hours lowered the likelihood of being a member of the "*medium well-being*" profile by 0.35 times. Meanwhile, one unit increase in having no SEN students in the class, getting a higher salary, and receiving more job support increased the likelihood of being a member of the "*medium well-being*" profile by 10.70, 1.97, and 4.81 times, respectively. In sum, these findings indicated that Hong Kong beginning ECEs who reported fewer job demands (i.e., not having SEN students in the class and shorter working

TABLE 3 | Summary of latent profile models.

	Log likelihood	Number of free Parameter	AIC	BIC	ABIC	Entropy	LMRT *p* value	BLRT *p* value	Class size per profile
1 Profile	−1127.602	16	2287.205	2331.400	2280.882	–	–	–	117
2 Profiles	**−1020.995**	**25**	**2091.990**	**2161.045**	**2082.017**	**0.882**	**0.023**	**<0.001**	**83/34**
3 Profiles	−986.819	34	2041.638	2135.552	2028.075	0.930	0.616	<0.001	33/81/3

Bolded entries represent the solution chosen in this study.

TABLE 4 | Means, standard deviations, and MANOVA tests for OWB indicators between the two profiles.

	Profile 1: Medium well-being		Profile 2: Relatively weak well-being – Emotional exhaustion		*F*(*1,115*)	*p*	Partial η^2
	M	SD	M	SD			
Job satisfaction	3.69	0.43	2.85	0.45	89.14	< 0.001	0.44
Work engagement: absorption	3.47	0.50	2.70	0.62	49.81	< 0.001	0.30
Work engagement: dedication	3.81	0.42	2.96	0.59	77.11	< 0.001	0.40
Work engagement: vigor	3.23	0.51	2.42	0.55	57.14	0.001	0.33
Job stress	2.50	0.74	3.22	0.53	26.67	< 0.001	0.19
Job burnout: emotional exhaustion	3.64	1.18	5.14	0.95	43.80	< 0.001	0.28
Job burnout: reduced efficacy	2.29	0.73	3.33	0.92	42.16	< 0.001	0.27
Job burnout: cynicism	2.05	1.20	3.58	1.36	36.36	< 0.001	0.24

hours) and more job resources (i.e., higher salary and more job support) at the very beginning of teaching career will likely develop a more positive OWB profile later on.

Contrast Findings From the Variable-Centered and Person-Centered Approaches

Findings from the two approaches showed both similarity and uniqueness. For the similar part, results of the two approaches reconciled to reveal that fewer job demands and more job resources were generally beneficial to the OWB of beginning ECEs. For the unique part, results from the variable-centered approach disclosed how well the whole sample was doing on each OWB indicator, but such information did not allow us to assess whether there exist qualitative distinct subpopulations concerning OWB profiles. Given that the OWB construct consists of a series of indicators concerning varying aspects of it and, that beginning ECEs, do not score uniformly low or high on all indicators, the OWB profiles possess more abundant information on the attitude of beginning ECEs toward their work than a specific OWB indicator does. By contrast, results from the person-centered approach, which considered all the examined OWB indicators, identified two qualitatively distinct subgroups, which complemented the findings of the variable-centered approach. Besides this key uniqueness, some other uniqueness included that the variable-centered approach demonstrated the varying magnitude of the prediction of job demands and/or job resources on each OWB indicator. This information may inform which specific job demand or resources could be targeted at to enhance a particular OWB indicator. By contrast, the predictive pattern of the person-centered approach suggested that how likely a specific job demand or resource might distinguish different subgroups, thereby providing information that helps identify vulnerable subgroups who might be in more dire need of support.

TABLE 5 | Logistic regression of class membership on predictors (with relatively weak well-being – emotional exhaustion as a reference group).

Predictors	Estimate	*SE*	*p*	OR	OR 95% CI
T2 Class size	−0.01	0.03	0.815	0.99	[0.93, 1.05]
T2 SEN students in class (1 = yes, 2 = no)	2.37	0.92	0.010	10.70	[1.76, 64.92]
T2 Working hours	−1.06	0.30	<0.001	0.35	[0.33, 0.37]
T2 Salary	0.68	0.34	0.046	1.97	[1.01, 3.84]
T2 Job support	1.57	0.46	0.001	4.81	[1.95, 11.84]

DISCUSSION

Given the importance of the OWB of ECEs in a range of job-related outcomes and the multiple changes and challenges during the transition from training to teaching, there is a dire need to understand the OWB of beginning ECEs. This study employed both variable-centered and person-centered approaches to explore the OWB of Hong Kong beginning ECEs and examined the role of job demands and resources. The variable-centered analysis found that beginning ECEs showed medium and above-medium levels of positive OWB indicators and medium and low levels of negative OWB indicators. The person-centered analysis further identified that beginning ECEs with different levels

of OWB indicators could be categorized into two distinct OWB profiles: the "*medium well-being*" and the "*relatively weak well-being – emotional exhaustion.*" Moreover, confirming our hypothesis, both variable-centered and person-centered results showed that fewer job demands and more job resources were associated with more positive OWB. To the best of our knowledge, this research is among the first to adopt both variable-centered and person-centered approaches to examine the OWB of beginning ECEs, especially in the Hong Kong context.

Occupational Well-Being of Beginning Early Childhood Educators

Previous findings suggested that compared to junior teachers, veteran teachers were not only more satisfied with their job (especially salary), but they also showed higher levels of burnout symptoms and less aspiration (Wong and Zhang, 2014; Chaaban and Du, 2017; Jones et al., 2019; Li et al., 2020; Schaack et al., 2020). By contrast, current results of the variable-centered approach suggested that the levels of the dedication of Hong Kong beginning ECEs were above medium and job satisfaction were medium, whereas the levels of two types of job burnout symptoms (i.e., reduced efficacy and cynicism) were low. These findings were somewhat consistent with the aforementioned findings from veteran teachers. However, since there were a number of OWB indicators and the level of each indicator was varied, only relying on the findings from the variable-centered approach did not allow us to qualitatively determine how good the OWB of the current sample was. With a person-centered approach that simultaneously considered all the examined indicators, we were able to reveal two qualitatively distinct subgroups (i.e., medium well-being and relatively weak well-being – emotional exhaustion), which complemented the findings from the variable-centered approach.

The results of the person-centered approach yielded some unique information. First, the results qualitatively showed that our current sample did not experience absolutely negative or absolutely positive OWB as no such profiles were identified. Second, about one-third of participants showed obvious emotional exhaustion during the early stage of teaching (i.e., the "*relatively weak well-being – emotional exhaustion*" profile). In other words, although many beginning ECEs in our sample did not experience alarming negative OWB issues, a proportion of them showed symptoms of emotional exhaustion at the early stage of their teaching career. Given that the core ideas of positive psychology suggest that optimal well-being should be reflected in the absence of ill-being and in the presence of well-being (Seligman and Csikszentmihalyi, 2000), we reckon that the OWB of the current sample is not optimal and needs to be strengthened, especially in mitigating their emotional exhaustion and enhancing the positive aspects of OWB.

Schaufeli et al. (2006) suggested that positive and negative OWB indicators are seemingly contradictory and that they are supposed to be adversely related to one another. Prior variable-centered studies found that ECEs with high levels of positive OWB indicators tend to score low on negative indicators, and vice versa (Yeşil Dağli, 2012; Gu et al., 2020; Penttinen et al., 2020; Li et al., 2021). The current results of the bivariate correlation analyses were largely, but not entirely, consistent with the aforementioned studies as some sets of bivariate correlations were not significant. On one hand, this implies that beginning ECEs high in some positive OWB indicators do not necessarily report low levels on some negative OWB indicators (and vice versa). On the other hand, it suggests the need to use a person-centered approach to conduct a more nuanced examination on the configuration of different OWB indicators in beginning ECEs. Noticeably, the current results are consistent with prior research which suggests that employees may simultaneously endorse seemingly contradictory OWB indicators (Moeller et al., 2018; Salmela-Aro et al., 2019). This also highlights the merits of applying LPA to investigate job-related attitudes and behavior of employees in an organizational setting (Spurk et al., 2020).

The Role of Job Demands and Job Resources

Confirming our hypotheses, both approaches revealed that fewer job demands and more job resources were related to better OWB. These results were largely consistent with previous variable-centered findings (Watt and Richardson, 2008; Yang and Zhao, 2016; Zinsser et al., 2016; Li and Li, 2020; Schaack et al., 2020) and supported the JD-R model (Bakker and Demerouti, 2014). Despite the similarity of the findings from both approaches, they provided different information and suggestions. For the variable-centered approach, job demands and job resources examined in this study predicted the OWB indicators differently. For instance, class size only predicted vigor while salary only predicted absorption and dedication. These findings informed *which* specific job demands and resources should be targeted to enhance a particular OWB indicator. For the person-centered approach, the predictive pattern, as mentioned earlier in the result section, informed how likely the examined job demands and resources could be used to identify subgroups *who* are more vulnerable and need more support to enhance their well-being at work. It is worthwhile to note that our study only examined a few job demands and resources relevant to ECEs, and most of them were demographics-oriented. Thus, it would be promising for future research to conduct a more systematic investigation by including other job demands (e.g., emotional demands and workload demands) and job resources (e.g., job control and leadership) relevant to the early childhood education setting to reveal a more complete picture of the risk and protective factors of the OWB of beginning ECEs.

Implications

The current findings have some implications for the examination and enhancement of the OWB of beginning ECEs. First, although few alarming negative OWB issues were found in the current sample, about one-third of them showed emotional exhaustion

at the very early stage of their teaching career. In addition, no absolute positive profile of OWB was identified. These findings highlighted the importance to reveal the subgroups who experienced emotional exhaustion and mitigate this issue among them and enhance the positive OWB indicators among the overall population. Second, as fewer job demands and more job resources at the early stage of teaching are related to a subsequently more positive OWB profile, it would be important for organizations to establish a facilitative working environment and guidance to promote adaptation and OWB of beginning ECEs. Finally, as beginning ECEs do not enter the workplace as a blank state but with their own abilities and characters (Tait, 2008), it is therefore important for ECE training institutes to provide pre-service teachers with systematic training to enhance competence and capacities to cope with job-related challenges and adaptive changes of their students so that they can develop a positive OWB during the transition from school to work. Findings from the variable-centered approach may also inform what specific predictors could be targeted.

Limitations and Future Directions

We must acknowledge that this study has several limitations. First, our current study focused on OWB among beginning ECEs who graduated from a two-year higher diploma program and worked for one semester in Hong Kong kindergartens. Given the differences between higher diploma and bachelor programs in terms of length and depth of training, the current findings may not be fully generalized to graduates from bachelor or other training programs. Relatedly, this research was conducted in Hong Kong, where education competition is fierce and the aspiration of parents for success by their children is high (Wong and Rao, 2015), and, therefore, the generalizability of the findings to other cultural contexts may be limited. It is important for future research to revisit this issue in other regions, especially from a cross-cultural perspective. Moreover, readers should be cautious that the current findings were mainly drawn from female ECEs as the gender ratio in this study was far from balance (i.e., 113 women vs. 4 men), although this ratio is quite consistent with the government census (Education Bureau, 2021). We encourage future studies to address this issue by including more male ECEs. Second, our sample size was relatively small, although the results of Monte Carlo analyses indicated sufficient statistical power for LPA. Nevertheless, it would be desirable for future research to use a larger sample size to re-examine this issue to obtain a more conclusive finding. Third, although we collected data at different time points as the study was correlational in nature and these data preclude strong claims regarding a causal influence of job demands and resources on OWB. Of note, we did not control for the baseline levels of OWB at T2 as the main research question in this study was about the relationships between the individual differences in T2 job demands or resources and T3 OWB rather than how T2 job demands or resources predicts the changes in OWB over time. It would be promising for future research to measure OWB indicators repeatedly so that their trajectories could be examined. Relatedly, the JD-R model also suggests that job demands and job resources may be reciprocally related to OWB indicators (Bakker and Demerouti, 2014). Future research may consider investigating this issue among beginning ECEs by following up with them for a certain period, as the findings would inform how the OWB of beginning ECEs changes over time and would disclose the course from entering to quitting the profession or sector. Moreover, future research may also consider carrying out intervention programs to examine whether manipulating job demands and resources would lead to corresponding changes in subsequent OWB.

Conclusion

The OWB of Beginning ECEs is important to job performance, child development, and the operation of early childhood education sectors. Using both variable and person-centered approaches, we find that the levels of the OWB indicators of Hong Kong beginning ECEs vary and that the complex pattern of these indicators could be categorized into two distinctive profiles (i.e., *medium well-being* and *relatively weak well-being – emotional exhaustion*). Moreover, we also disclose that fewer job demands and more resources upon employment are important for beginning ECEs to develop positive OWB subsequently. These results inform *which* leverage points could be targeted to enhance a specific OWB indicator and identify *who* would be in dire need to enhance their OWB at the very beginning of their teaching career.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by The Education University of Hong Kong. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

J-BL and AY contributed to conception and designed of the study. J-BL and TL collected the data. J-BL, AY, and RZ performed the statistical analysis. J-BL wrote the first draft of the manuscript. AY, RZ, TL, and ZL wrote sections of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

FUNDING

J-BL was supported by the Departmental Research Grant (No. DRG2017-18/001). AY was supported by Grant (Nos. 299-X5216193 and 299-GK19G062) of Guangdong University of Foreign Studies.

REFERENCES

Akaike, H. (1974). A new look at the statistical model identification. *IEEE Trans. Automat. Control* 19, 716–723. doi: 10.1109/TAC.1974.1100705

Arminger, G., Stein, P., and Wittenberg, J. (1999). Mixtures of conditional mean- and covariance-structure models. *Psychometrika* 64, 475–494. doi: 10.1007/BF02294568

Arnett, J. J. (2000). Emerging adulthood: a theory of development from the late teens through the twenties. *Am. Psychol.* 55, 469–480. doi: 10.1037/0003-066X.55.5.469

Asparouhov, T., and Muthén, B. (2014). Auxiliary variables in mixture modeling: three-step approaches using Mplus. *Struct. Equ. Model.* 21, 329–341. doi: 10.1080/10705511.2014.915181

Audit Commission (2013). *Pre-Primary Education Voucher Scheme (Director of Audit Report No. 60)*. Hong Kong: Hong Kong Audit Commission.

Bakker, A. B., and Demerouti, E. (2007). The job demands-resources model: State of the art. *J. Manag. Psychol.* 22, 309–328. doi: 10.1108/02683940710733115

Bakker, A. B., and Demerouti, E. (2014). "Job demands-resources theory," in *Work and Wellbeing: Wellbeing: A Complete Reference Guide*, Vol. III, eds P. Y. Chen and C. L. Cooper (Hoboken, NJ: John Wiley & Sons, Ltd), 1–28. doi: 10.1002/9781118539415.wbwell019

Blase, J. J. (1982). A social-psychological grounded theory of teacher stress and burnout. *Educ. Adm. Q.* 18, 93–113. doi: 10.1177/0013161X82018004008

Chaaban, Y., and Du, X. (2017). Novice teachers' job satisfaction and coping strategies: overcoming contextual challenges at Qatari government schools. *Teach. Teach. Educ.* 67, 340–350. doi: 10.1016/j.tate.2017.07.002

Cheng, J. N., and Chen, Y. (2011). The empirical study of the kindergarten teachers' job satisfaction in Taiwan: exploring the effect of the intrinsic demand, external reward, and organizational treatment. *J. Hum. Resour. Adult Learn.* 7, 127–132.

Corbell, K. A., Osborne, J., and Reiman, A. J. (2010). Supporting and retaining beginning teachers: a validity study of the perceptions of success inventory for beginning teachers. *Educ. Res. Eval.* 16, 75–96. doi: 10.1080/13803611003722325

Cumming, T. (2017). Early childhood educators' well-being: an updated review of the literature. *Early Child. Educ. J.* 45, 583–593. doi: 10.1007/s10643-016-0818-6

De Stasio, S., Fiorilli, C., Benevene, P., Boldrini, F., Ragni, B., Pepe, A., et al. (2019). Subjective happiness and compassion are enough to increase teachers' work engagement? *Front. Psychol.* 10:2268. doi: 10.3389/fpsyg.2019.02268

Education Bureau. (2017). *Education Bureau circular No.15/2017 – Free Quality Kindergarten Education Scheme Kindergarten Administration Guide*. Available online at: https://www.edb.gov.hk/attachment/en/edu-system/preprimary-kindergarten/free-quality-kg-edu/EDBC17015E.pdf (accessed September 8, 2017).

Education Bureau (2021). *Figures and Statistics*. Available online at: https://www.edb.gov.hk/en/about-edb/publications-stat/figures/index.html (accessed July 15, 2021).

Fimian, M. J., and Fastenau, P. S. (1990). The validity and reliability of the teacher stress inventory: a re-analysis of aggregate data. *J. Organ. Behav.* 11, 151–157. doi: 10.1002/job.4030110206

Gong, X., Niu, C., and Wang, J. (2020). The status quo, sources and influencing factors of professional pressure faced by preschool teachers in rural China: an empirical study based on multiple counties in Hubei Province. *Best Evid. Chin. Educ.* 6, 715–738. doi: 10.15354/bece.20.ar070

Gu, Y., Wang, R., and You, X. (2020). Recovery experiences moderate the impact of work stressors on well-being: a two-wave study of preschool teachers. *Early Child. Educ. J.* 48, 189–202. doi: 10.1007/s10643-019-00994-w

Hakanen, J. J., Bakker, A. B., and Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *J. Sch. Psychol.* 43, 495–513. doi: 10.1016/j.jsp.2005.11.001

Hall-Kenyon, K. M., Bullough, R. V., MacKay, K. L., and Marshall, E. E. (2014). Preschool teacher well-being: a review of the literature. *Early Child. Educ. J.* 42, 153–162. doi: 10.1007/s10643-013-0595-4

Harmsen, R., Helms-Lorenz, M., Maulana, R., and van Veen, K. (2018). The relationship between beginning teachers' stress causes, stress responses, teaching behaviour and attrition. *Teach. Teach.* 24, 626–643. doi: 10.1080/13540602.2018.1465404

Hipp, J. R., and Bauer, D. J. (2006). Local solutions in the estimation of growth mixture models. *Psychol. Methods* 11, 36–53. doi: 10.1037/1082-989X.11.1.36

Hong Kong Federation of Education Workers (2019). *Survey of Early Childhood Educators' Working Situation*. Available online at: www.tinyurl.com/wvzya483 (accessed June 20, 2021).

Howard, M. C., and Hoffman, M. E. (2018). Variable-centered, person-centered, and person-specific approaches: where theory meets the method. *Organ. Res. Methods* 21, 846–876. doi: 10.1177/1094428117744021

Jeon, L., Buettner, C. K., Grant, A. A., and Lang, S. N. (2019). Early childhood teachers' stress and children's social, emotional, and behavioral functioning. *J. Appl. Dev. Psychol.* 61, 21–32. doi: 10.1016/j.appdev.2018.02.002

Ji, D., and Yue, Y. (2020). Relationship between kindergarten organizational climate and teacher burnout: Work-family conflict as a mediator. *Front. Psychiatry* 11:408. doi: 10.3389/fpsyt.2020.00408

Jones, C., Hadley, F., Waniganayake, M., and Johnstone, M. (2019). Find your tribe! Early childhood educators defining and identifying key factors that support their workplace wellbeing. *Australas. J. Early Child.* 44, 326–338. doi: 10.1177/1836939119870906

Leung, D. Y. P., and Lee, W. W. S. (2006). Predicting intention to quit among Chinese teachers: differential predictability of the components of burnout. *Anxiety Stress Coping* 19, 129–141. doi: 10.1080/10615800600565476

Li, J. B., Leung, I. T. Y., and Li, Z. (2021). The pathways from self-control at school to performance at work among novice kindergarten teachers: the mediation of work engagement and work stress. *Child. Youth Serv. Rev.* 121:105881. doi: 10.1016/j.childyouth.2020.105881

Li, S., Li, Y., Lv, H., Jiang, R., Zhao, P., Zheng, X., et al. (2020). The prevalence and correlates of burnout among Chinese preschool teachers. *BMC Public Health* 20:160. doi: 10.1186/s12889-020-8287-7

Li, Z., and Li, J. B. (2020). The association between job stress and emotional problems in mainland Chinese ECE teachers: the mediation of self-control and the moderation of perceived social support. *Early Educ. Dev.* 31, 491–506. doi: 10.1080/10409289.2019.1669127

Lo, Y., Mendell, N., and Rubin, D. (2001). Testing the number of components in a normal mixture. *Biometrika* 88, 767–778. doi: 10.1093/biomet/88.3.767

Magnusson, D. (2003). "The person approach: concepts, measurement models, and research strategy," in *New Directions for Child and Adolescent Development: Person-Centered Approaches to Studying Development in Context*, eds S. C. Peck and R. W. Roeser (San Francisco, CA: Jossey-Bass), 3–23.

Maslach, C. H., Schaufeli, W. B., and Leiter, M. P. (2001). Job burnout. *Annu. Rev. Psychol.* 52, 397–422. doi: 10.1146/annurev.psych.52.1.397

Moeller, J., Ivcevic, Z., White, A. E., Menges, J. I., and Brackett, M. A. (2018). Highly engaged but burned out: intra-individual profiles in the US workforce. *Career Dev. Int.* 23, 86–105. doi: 10.1108/cdi-12-2016-0215

Muthén, L. K., and Muthén, B. O. (2002). How to use a Monte Carlo study to decide on sample size and determine power. *Struct. Equ. Model.* 9, 599–620. doi: 10.1207/s15328007sem0904_8

Muthén, L. K., and Muthén, B. O. (1998-2012). *Mplus User's Guide*, 7th Edn. Los Angeles, CA: Muthén & Muthén.

Nylund, K. L., Asparouhov, T., and Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: a Monte Carlo simulation study. *Struct. Equ. Model.* 14, 535–569. doi: 10.1080/10705510701575396

Peele, M., and Wolf, S. (2021). Depressive and anxiety symptoms in early childhood education teachers: Relations to professional well-being and absenteeism. *Early Child. Res. Q.* 55, 275–283. doi: 10.1016/j.ecresq.2020.11.008

Penttinen, V., Pakarinen, E., von Suchodoletz, A., and Lerkkanen, M.-K. (2020). Relations between kindergarten teachers' occupational well-being and the quality of teacher-child interactions. *Early Educ. Dev.* 31, 994–1010. doi: 10.1080/10409289.2020.1785265

Rao, N. (2010). Educational policy, kindergarten curriculum guidelines and the quality of teaching and learning: lessons from kindergarten in Hong Kong. *Int. J. Early Child. Educ.* 16, 27–39.

Ryan, R. M., and Deci, E. L. (2001). On happiness and human potentials: a review of research on hedonic and eudaimonic well-being. *Annu. Rev. Psychol.* 52, 141–166. doi: 10.1146/annurev.psych.52.1.141

Salmela-Aro, K., Hietajärvi, L., and Lonka, K. (2019). Work burnout and engagement profiles among teachers. *Front. Psychol.* 10:2254. doi: 10.3389/fpsyg.2019.02254

Schaack, D. D., Le, V. N., and Stedron, J. (2020). When fulfillment is not enough: early childhood teacher occupational burnout and turnover intentions from a job demands and resources perspective. *Early Educ. Dev.* 31, 1011–1030. doi: 10.1080/10409289.2020.1791648

Schaufeli, W. B., Bakker, A. B., and Salanova, M. (2006). The measurement of work engagement with a short questionnaire. *Educ. Psychol. Meas.* 66, 701–716. doi: 10.1177/0013164405282471

Schaufeli, W. B., Salanova, M., González-Romá, V., and Bakker, A. B. (2002). The measurement of engagement and burnout: a two sample confirmatory factor analytic approach. *J. Happiness Stud.* 3, 71–92. doi: 10.1023/A:1015630930326

Schwarz, G. (1978). Estimating the dimension of a model. *Ann. Stat.* 6, 461–464. doi: 10.1214/aos/1176344136

Seligman, M. E. P., and Csikszentmihalyi, M. (2000). Positive psychology: an introduction. *Am. Psychol.* 55, 5–14. doi: 10.1037/0003-066X.55.1.5

Skaalvik, E. M., and Skaalvik, S. (2011). Teacher job satisfaction and motivation to leave the teaching profession: relations with school context, feeling of belonging, and emotional exhaustion. *Teach. Teach. Educ.* 27, 1029–1038. doi: 10.1016/j.tate.2011.04.001

Sönmez, S., and Betül Kolaşınlı, I. (2020). The effect of preschool teachers' stress states on classroom climate. *Education* 49, 190–202. doi: 10.1080/03004279.2019.1709528

Spurk, D., Hirschi, A., Wang, M., Valero, D., and Kauffeld, S. (2020). Latent profile analysis: a review and "how to" guide of its application within vocational behaviour research. *J. Vocat. Behav.* 120:103445. doi: 10.1016/j.jvb.2020.103445

Stanley, L., Kellermanns, F. W., and Zellweger, T. M. (2017). Latent profile analysis: understanding family firm profiles. *Fam. Bus. Rev.* 30, 84–102. doi: 10.1177/0894486516677426

Tait, M. (2008). Resilience as a contributor to novice teacher success, commitment, and retention. *Teach. Educ. Q.* 35, 57–75.

Tiplic, D., Brandmo, C., and Elstad, E. (2015). Antecedents of Norwegian beginning teachers' turnover intentions. *Camb. J. Educ.* 45, 451–474. doi: 10.1080/0305764X.2014.987642

Tsai, E., Fung, L., and Chow, L. (2006). Sources and manifestations of stress in female kindergarten teachers. *Int. Educ. J.* 7, 364–370.

Tsui, A. S., Egan, T. D., and O'Reilly, C. A. III (1992). Being different: relational demography and organizational attachment. *Adm. Sci. Q.* 37, 549–579. doi: 10.2307/2393472

Van de Vijver, F. J. R., and Hambleton, R. K. (1996). Translating tests: some practical guidelines. *Eur. Psychol.* 1, 89–99. doi: 10.1027/1016-9040.1.2.89

Van Horn, J. E., Taris, T. W., Schaufeli, W. B., and Schreurs, P. J. G. (2004). The structure of occupational well-being: a study among Dutch teachers. *J. Occup. Organ. Psychol.* 77, 365–375. doi: 10.1348/0963179041752718

Wang, Z., Chen, L., and Li, X. P. (2015). Transformational leadership and work engagement: an affect perspective. *Manage. Rev.* 27, 120–129.

Watt, H. M., and Richardson, P. W. (2008). Motivations, perceptions, and aspirations concerning teaching as a career for different types of beginning teachers. *Learn. Inst.* 18, 408–428. doi: 10.1016/j.learninstruc.2008.06.002

Whitaker, R. C., Dearth-Wesley, T., and Gooze, R. A. (2015). Workplace stress and the quality of teacher–children relationships in Head Start. *Early Child. Res. Q.* 30, 57–69. doi: 10.1016/j.ecresq.2014.08.008

Wong, J. M., and Rao, N. (2015). The evolution of early childhood education policy in Hong Kong. *Int. J. Child Care Educ. Policy* 9, 3. doi: 10.1007/s40723-015-0006-y

Wong, Y. H. P., and Zhang, L. F. (2014). Perceived school culture, personality types, and wellbeing among kindergarten teachers in Hong Kong. *Australas. J. Early Child.* 39, 100–108. doi: 10.1177/183693911403900213

Yang, R., and Zhao, Z. (2016). A survey regarding the career identity of pre-service early childhood teachers. *J. Chongqing City Manage. Coll.* 16, 70–73.

Yeşil Dağli, U. (2012). America's Public School Kindergarten Teachers'. Job Turnover and Associated Factors. *Educ. Sci. Theory Pract.* 12, 3121–3134.

Yuen, M., Lau, P. S., Shek, D. T., and Lam, M. P. (2002). Confirmatory factor analysis and reliability of the Chinese version of the Maslach Burnout Inventory among guidance teachers in Hong Kong. *Psychol. Rep.* 91, 1081–1086. doi: 10.2466/pr0.2002.91.3f.1081

Zhou, S., Li, X., and Gao, B. (2020). Family/friends support, work-family conflict, organizational commitment, and turnover intention in young preschool teachers in China: a serial mediation model. *Child. Youth Serv. Rev.* 113:104997. doi: 10.1016/j.childyouth.2020.104997

Zinsser, K. M., Christensen, C. G., and Torres, L. (2016). She's supporting them; who's supporting her? Preschool center-level social-emotional supports and teacher well-being. *J. Sch. Psychol.* 59, 55–66.

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2021 Li, Yang, Zhang, Leung and Li. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

frontiers in Psychology

ORIGINAL RESEARCH
published: 28 March 2022
doi: 10.3389/fpsyg.2022.826828

Teachers' Well-Being, Emotions, and Motivation During Emergency Remote Teaching Due to COVID-19

Ernesto Panadero[1,2], Juan Fraile[3], Leire Pinedo[1], Carlos Rodríguez-Hernández[4], Eneko Balerdi[1] and Fernando Díez[1]*

[1] University of Deusto, Bilbao, Spain, [2] IKERBASQUE Basque Foundation for Science, Bilbao, Spain, [3] Universidad Francisco de Vitoria, Pozuelo de Alarcón, Spain, [4] Institute for the Future of Education, Tecnológico de Monterrey, Monterrey, Mexico

This study explores the effects of the shift to emergency remote teaching (ERT) on teachers' levels of well-being, emotions, and motivation. A total of 936 Spanish teachers participated in this nationwide survey from all educational levels, thus allowing comparison among levels, which is a novelty and strength of our study. Four aspects were explored: (1) instructional adaptation to ERT; (2) well-being changes and the main challenges in this regard; (3) changes in emotions; and (4) changes in motivation and the main factors. Importantly, we explored a number of teacher characteristics (e.g., gender, age) for the three last aspects. Our results show that teachers felt the impact of ERT on their well-being, emotions, and motivation. Additionally, female teachers, teachers with students of low socioeconomic status (SES), in public schools, and primary and secondary teachers were the most affected groups. This indicates that the impact of ERT differed and some populations of teachers are more at risk of suffering burnout because of ERT.

Keywords: teachers' well-being, teachers' emotional reactions, teachers' motivations, COVID-19, emergency remote teaching

OPEN ACCESS

Edited by:
Simon Beausaert, Maastricht University, Netherlands

Reviewed by:
Mei-Lin Chang, Kennesaw State University, United States
Christos Troussas, University of West Attica, Greece

***Correspondence:**
Juan Fraile
juan.fraile@ufv.es

Specialty section:
This article was submitted to Organizational Psychology, a section of the journal Frontiers in Psychology

Received: *01 December 2021*
Accepted: *18 February 2022*
Published: *28 March 2022*

Citation:
Panadero E, Fraile J, Pinedo L, Rodríguez-Hernández C, Balerdi E and Díez F (2022) Teachers' Well-Being, Emotions, and Motivation During Emergency Remote Teaching Due to COVID-19. Front. Psychol. 13:826828. doi: 10.3389/fpsyg.2022.826828

INTRODUCTION

Principals and teachers are crucial actors in our educational systems and, therefore, they are themselves a form of social capital (Beausaert et al., 2021). Significant attention in educational research has been paid to teachers' professional development in service (Postholm, 2012) as well as during pre-service teacher training (Aypay, 2009), as it is agreed that teachers' knowledge about their profession is key for enhancing students' success within educational systems. Importantly, we also know that as much as teachers need to have technical knowledge, they also need to feel motivated to perform the challenging task of being in front of their students, who have all types of needs. A significant line of research has thus focused on teachers' well-being, emotions, and motivational levels due to the huge influence they have on the students' academic success (Sutton and Wheatley, 2003).

The recent COVID-19 pandemic has forced governments in most countries to establish lockdowns. Regular classroom settings were interrupted by these lockdowns and instruction shifted to what has been called 'emergency remote teaching' (ERT) (Hodges et al., 2020). The sudden implementation of online teaching worldwide has changed the way teachers and learners communicate and interact, influencing crucial instructional aspects (e.g., assessment practices)

(Bozkurt et al., 2020; Rapanta et al., 2020; Tejedor et al., 2021). Unfortunately, most of the teachers were not trained for immersion in online teaching, and these changes seem to have increased the already high levels of stress and demotivation among teachers (Ozamiz-Etxebarria et al., 2021), thus having an impact on the instructional setting and students' learning. We therefore investigated the gravity of these changes and analyzed how teacher characteristics might have exacerbated or mitigated these negative effects on teachers' well-being, emotions, and motivation. An important novelty of our study is the comparison among teachers from different educational levels within the same study.

Teachers' Well-Being

Defining well-being is not easy as there are many perspectives and theories that try to delimitate this concept. As a general definition, it can be said that well-being is the state of being comfortable, healthy, or happy. Importantly, well-being is not the absolute lack of challenges but "a state. . .in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community" (World Health Organization, 2015, as cited in Beausaert et al., 2021, p. 3). More specifically, Juniper (2011) has defined work-related well-being as "that part of an employee's overall well-being that they perceive to be determined primarily by work and can be influenced by workplace interventions" (p. 347). When we use well-being in reference to teachers, we are referring to their work at their educational institutions. Teachers' well-being is influenced by a myriad of contextual factors, such as institutional resources and support (Kumpikaitė-Valiūnienė et al., 2021), workload, or students' behavior in the classroom (Chan et al., 2021), as well as by teacher-specific personal variables such as personality or engagement at work (Jelińska and Paradowski, 2021).

Teachers' well-being has been shown to be an important predictor of burnout (Bermejo-Toro et al., 2016), to have a strong relationship with teachers' motivation and self-efficacy (Collie et al., 2015), and even to influence students' academic performance (Marks and Louis, 1997). The imposition of ERT created both contextual pressures (e.g., teaching in a completely different instructional environment) and personal constraints (e.g., screen fatigue, psychological challenges, and the added stress of taking care of their children at home while working) (Clark et al., 2021). Additionally, some teachers had to use multiple online platforms in parallel including learning management systems (Moodle or E-class) and communicative platforms (Google Meet, Zoom or MS Teams), which complicates the organization of tasks (Kanetaki et al., 2021). In this line, teachers have also increased the use of gamified activities that involve coping with technical difficulties, although they facilitate students' motivation given that they contribute fun to learning (Krouska et al., 2022). We therefore explored the variation in teachers' well-being before and after ERT, analyzed the main reasons for these changes, and sought to uncover how teachers dealt with these challenges. This information can be used for more tailored and specific interventions.

Teachers' Emotions

Obviously, there is a direct link between teachers' well-being and the type of emotions they experience at work (Day and Qing, 2009). While teachers' emotions have received less attention than students,' there a significant body of knowledge has been produced around this topic (Frenzel, 2014). Without a doubt, teachers' emotions are important on their own: no one wants teachers to suffer from burnout or depression; nevertheless, their emotions are also crucial for students' academic achievement. Frenzel et al. (2021) developed a model in which teachers' emotions affect students *via* three teaching behaviors: relationship building, non-verbal social messages, and instructional strategies. They also established a direct transmission effect between teachers' emotions and student outcomes (i.e., students' emotions, beliefs, motivation, discipline, and performance), which is also supported by previous research (Sutton and Wheatley, 2003).

Importantly, teachers have a higher risk of burnout than other professions (Hakanen et al., 2006), and this negative risk is strongly influenced by the negative emotions that professionals feel at their workplace (Chang, 2009). Currently, teacher dropout rates are fairly high owing to psychological causes related to their experience of negative emotions (e.g., sadness, tiredness, or anxiety disorders) (Frenzel, 2014). In this vein, teachers have managed potential intrapersonal conflicts during the pandemic, as the job requires numerous social contacts, and social distancing might be difficult to maintain, which might have produced negative emotions (Nabe-Nielsen et al., 2021). It is thus important to identify what strategies are helping teachers cope with stressful situations, as the increased use of avoidance coping is associated with increasing levels of stress and a variety of negative emotions (e.g., anxiety, anger, sadness, and loneliness) (MacIntyre et al., 2020). Considering the above, exploring teachers' emotions in the context of ERT is key to our understanding of how they have coped and what impact this situation has had on teachers.

Teachers' Motivation

As discussed in an empirical review by Sutton and Wheatley (2003), teachers' emotions have a direct reciprocal influence on their motivation. According to Watt and Richardson (2015), research on teachers' motivation has received a significant impulse focusing around three main motivation theories: expectancy-value, achievement goal, and self-determination. Importantly, other authors have claimed that teachers' motivation cannot be explained based on the same models we hold for students, as their achievement context is different (Fives and Buehl, 2016). Regardless of these foundational arguments, it is without a doubt agreed that teachers' motivation is key to their social capital within educational systems (Han and Yin, 2016; Beausaert et al., 2021).

As with teachers' emotions, motivation also affects the type of instructional strategies teachers employ (Fives and Buehl, 2016) and students' outcomes, such as help seeking or cheating (Butler and Shibaz, 2008). It is important to consider the main factors influencing teachers' motivation, and much research has

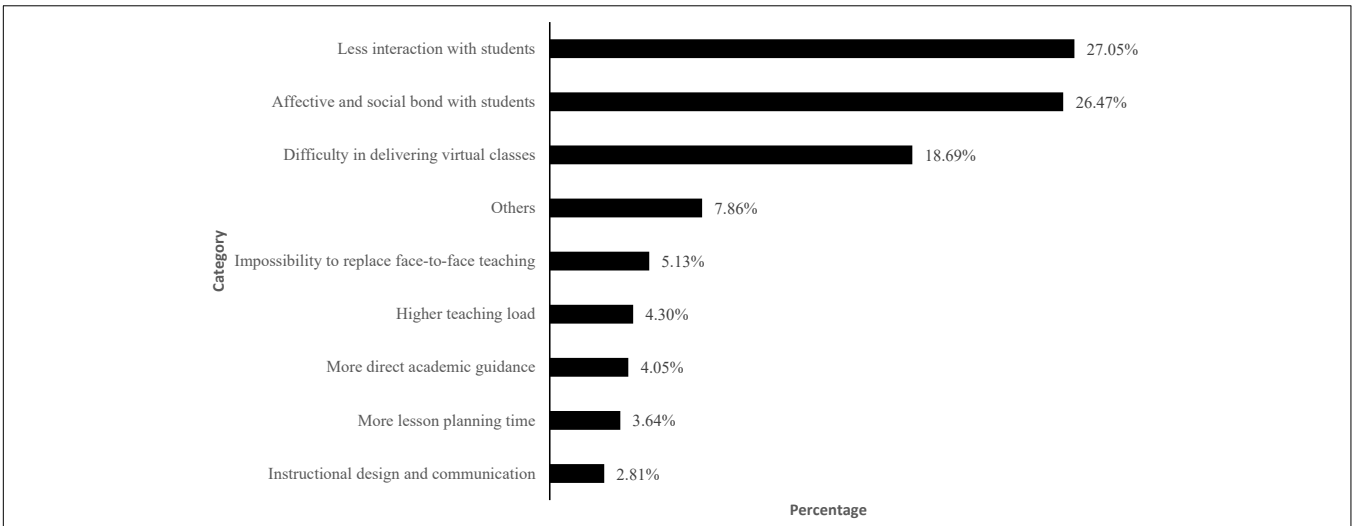


FIGURE 1 | Main changes in teaching practices (n = 1209). *Less interaction with students* includes less feedback, efficiency and dynamism with families and students, and no motivation (12.49%), difficulty for checking students' progress (7.86%), and difficulty for contacting students' families (6.7%). *Difficulty in delivering virtual classes* includes difficulty in proposing practices and explaining the subject (11%), and ICT dependency (7.69%). *Higher teacher load* refers to poor work-life balance, less privacy, lack of specific work schedule (reply to emails outside of working hours). *Others* includes categories with a presence lower than 2%: reaching students with different needs (1.99%), responding to students' self-learning (1.41%), responding to students' questions in class (1.08%), more flexible schedules (0.91%), opportunity to innovate in the subject (0.83%), more feedback (0.74%), no changes (0.58%), and unclassifiable answer (0.32%).

considered how contextual factors influence teachers' motivation (Fives and Buehl, 2016). Aspects such as institutional climate, sense of belonging to the community, or relationships with students largely influence teachers' motivation.

As with well-being and emotions, it is to be expected that the impact of ERT has affected teachers' motivation due to the constraints and pressures of the exceptional situation; interestingly, this has received less attention than well-being. Next we briefly outline three studies on the topic. Kulikowski et al. (2021a) found four core job characteristics (task identity, task significance, autonomy, and social dimension) that might decrease as a result of ERT, thus affecting teachers' motivation and job performance. Khanal et al. (2021) found that teachers in private schools reported being intrinsically and extrinsically demotivated due to several factors, such as heavy workload, students' disruptive behaviors, and lack of professional development events, among others (Khanal et al., 2021). Finally, in the same direction, the findings of Panisoara et al. (2020) showed that, during remote teaching, teachers' extrinsic motivation significantly increased occupational stress (i.e., burnout) whereas intrinsic motivation decreased it. Due to these previous results it is therefore important to explore teachers' motivational levels, the main factors influencing their motivation, and what strategies they use to regulate their motivation.

Aim and Research Questions

As discussed above, there are direct links between teachers' well-being, emotions, and motivational level (e.g., Sutton and Wheatley, 2003; Fives and Buehl, 2016; Frenzel et al., 2021). These elements are so interrelated that they depend on each other and, at the same time, they are also identifiable as independent constructs with large amount of empirical evidence behind each of them. We therefore decided to explore them to gain a comprehensive picture of the effects of ERT while using independent questions. We also investigated if teachers had changed their instructional settings, as these changes would imply effort and a significant amount of time, therefore also impacting their well-being, emotions, and motivation. Our aim was to investigate how ERT affected the well-being, emotional state, and motivation of teachers by exploring the changes, challenges, and strategies used to cope, while exploring whether the teachers' characteristics might have exacerbated or mitigated these effects. The study is organized around four research questions (RQ):

> RQ1: Did teachers receive training for the ERT, did they change their instructional setting, and did teachers' characteristics influence these changes?
>
> RQ2: Did teachers' well-being change, what were the challenges to well-being, and what characteristics influenced this change?
>
> RQ3: Did teachers' emotions change, and what characteristics influenced this change?
>
> RQ4: What was the teachers' motivational level, which factors affected it, and what characteristics influenced this level?

MATERIALS AND METHODS

Participants

The sample included 936 Spanish teachers from early childhood education (n = 64; 6.8%), primary education (n = 207; 22.1%),

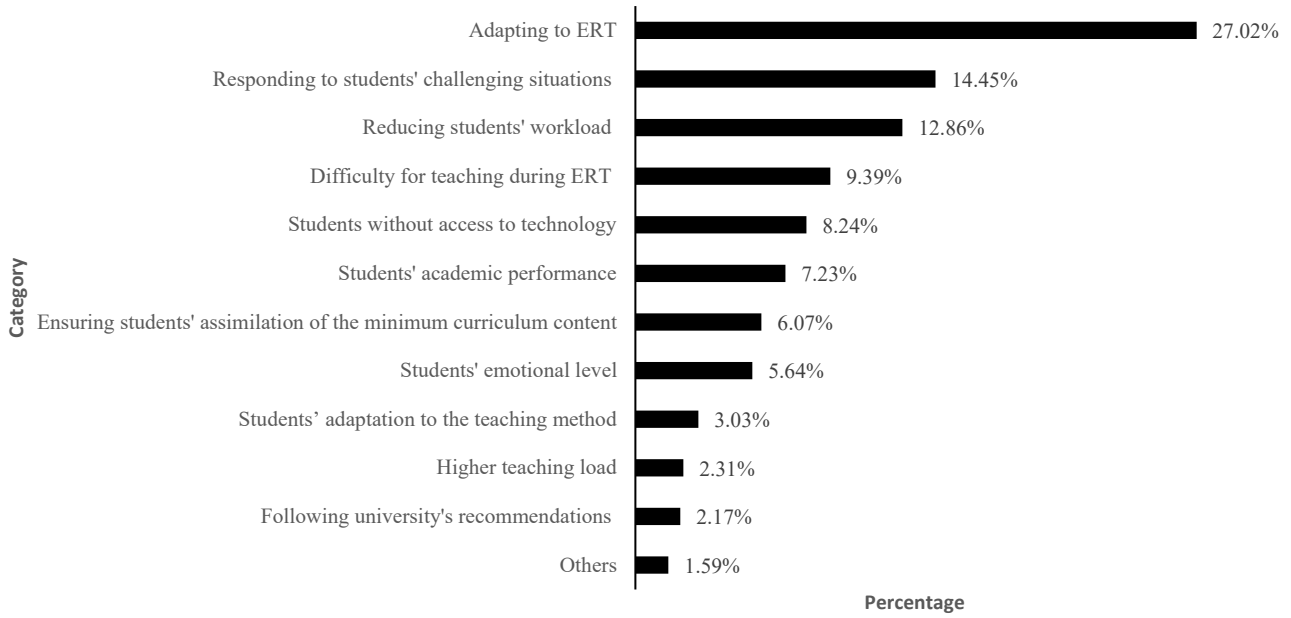


FIGURE 2 | Main reasons for introducing instructional changes (n = 692). *Responding to students' challenging situations* includes problematic circumstances for students (7.08%), students' autonomy when studying for the subject (4.48%), and students' difficulty in understanding the subject and submitting assignments (2.89%). *Reducing students' workload* refers to avoiding students being overwhelmed or responding to families' requests to reduce students' workload.

secondary education (n = 337; 36%), vocational education (n = 85; 9.1%), higher education (n = 192; 20.5%), and other educational contexts (n = 51; 5.4%). In terms of gender distribution, 641 (68.5%) of the participants were female. Of the sample, 798 (85.3%) worked in public institutions, 90 (9.6%) in state-subsidized institutions, and 48 (5.1%) in private institutions. The average age of participants was 44.8 years (SD = 10.88), and they had 15.8 years of teaching experience (SD = 10.66). Regarding qualifications, the entire sample held a university degree, 160 (17.1%) had a master's degree, and 190 (20.3%) had a PhD. All 17 autonomous communities of Spain were represented. We used convenience sampling of those teachers who voluntarily decided to participate. We sent a summary of the results to participants who provided an email.

Instrument

Our self-report survey contained 91 questions. First, we asked for demographic and personal data, including gender; age; location; educational level; school type (public, state-subsidized, or private); qualifications; years of teaching experience; and if they had to cease working due to COVID-19. We then asked participants about their area of teaching expertise, the theoretical/practical character of the topic they teach, the availability of technical equipment, the socioeconomic profile of their students, and their assessment practices. Finally, we asked questions regarding instructional teaching changes, teachers' perceived well-being, teachers' positive and negative emotions, and teachers' level of motivation.

COVID-19 in Spain

Between March 9, 2020 (beginning in Madrid and the Basque Country) and March 16, 2020, all educational institutions at all levels were gradually closed. The state of alarm ended on June 21, 2020, with some restrictions remaining.

Procedure

We developed the survey on an online platform and disseminated it by email, text messages, and social network sites. For email distribution, we used a database from a previous research project to reach over 8,000 teachers at all educational levels. We also asked the participants to share the information with their colleagues. Although the Spanish government declared the lockdown in March 2020, including the closure of educational institutions, we waited until April to distribute the instrument. The rationale was to wait some weeks for teachers to have a more precise and extended experience of what ERT entailed, including the regulatory actions and guidelines released by the educational administration.

Data Analysis

We conducted several statistical analyses to investigate the effects of the ERT on teachers' well-being, emotion, and motivation in comparison with different teachers' characteristics. We therefore calculated contingency tables and Chi-squared tests to answer RQ1 and RQ3. We used a Wilcoxon signed-rank test for RQ2. Finally, one-way ANOVAs were performed to answer RQ4.

TABLE 1 | Changes in course objectives and contents.

	N	*More challenging*	*Same*	*Less challenging*	*Other*	*Chi-squared test*	
Total	936	15	342	512	67		
Age							
Less than 37	242	4	81	138	19	Cramer's V	0.07
Between 38 and 45	237	4	80	140	13	X^2 (9, N = 935)	13.29
Between 46 and 54	249	4	85	140	20	Significance level	0.15
More than 55	207	2	96	94	15		
Educational level							
Early childhood	64	1	15	39	9	Cramer's V	0.22
Primary education	207	3	36	157	11	X^2 (15, N = 936)	137.07
Secondary education	337	3	108	198	28	Significance level	<0.001
Higher education	192	4	130	50	8		
Vocational education	85	3	32	44	6		
Other level	51	1	21	24	5		
Experience years							
Less than 6	212	2	71	122	17	Cramer's V	0.07
Between 6 and 15	211	3	51	144	13	X^2 (9, N = 789)	10.24
Between 16 and 24	176	3	61	95	17	Significance level	0.33
More than 25	190	2	61	113	14		
Gender							
Female	641	7	216	368	50	Cramer's V	0.11
Male	295	8	126	144	17	X^2 (3, N = 936)	11.70
						Significance level	0.01
School type							
State-subsidized & private	138	1	79	50	8	Cramer's V	0.18
Public	798	14	263	462	59	X^2 (3, N = 936)	30.29
						Significance level	<0.001
Students' Socioeconomic Status							
Low	267	7	70	176	14	Cramer's V	0.11
Intermediate low	291	5	107	152	27	X^2 (9, N = 921)	35.26
Intermediate high	197	1	75	106	15	Significance level	<0.001
High	166	2	84	69	11		

RESULTS

RQ1: Did Teachers Receive Training for the Emergency Remote Teaching, Did They Change Their Instructional Setting, and Did Teachers' Characteristics Influence These Changes?

We first asked teachers about their training for ERT: 68.23% did not receive training, while 31.77% had received it. The ones who had received it considered the training as: Excellent (10.06%), Satisfactory (38.25%), Sufficient (28.52%), Insufficient (20.13%), and Poor (1.67%). Additionally, we asked in an open-ended question what the main changes in their teaching practice had been. As shown in **Figure 1**, these were related to less interaction with their students (27.05%), affective and social bound with of students (26.47%), and in delivering virtual classes, proposing practices, and explaining the subject (18.69%).

Finally, we asked about the reasons for those instructional changes (**Figure 2**), with the following being the main ones: adapting to ERT (27.02%), responding to students' challenging situations (14.45%), and reducing students' workload (12.86%).

We subsequently determined the relationship between teacher characteristics and instructional changes. As shown in **Table 1**, there was a significant relationship between educational level, gender, school type, students' socioeconomic status (SES), and changes in course objectives and contents. Educational level was more strongly related to changes in course objectives and content (largest Cramer's V). Conversely, there was not a significant relationship between age and years of experience and changes in course objectives and contents. Consequently, teachers who were more likely to pose less challenging course objectives and content were those working in secondary education, or whose students came from low SES conditions. Contrary, higher education teachers or those with intermediate-low SES students were more likely to pose course objectives and contents as challenging as before ERT. Remarkably, female teachers or public-school teachers were more likely to pose the same or less challenging course objectives and content.

Next, we investigated the relationship between several teacher characteristics and changes in student workload.

TABLE 2 | Changes in students' workload.

	N	More workload	Same	Less workload	Other	Chi-squared test	
Total	936	40	321	533	42		
Age							
Less than 37	242	13	62	160	7	Cramer's V	0.12
Between 38 and 45	237	7	72	149	9	X^2 (9, N = 935)	39.08
Between 46 and 54	249	7	88	138	16	Significance level	<0.001
More than 55	207	12	99	86	10		
Educational level							
Early childhood	64	1	8	46	9	Cramer's V	0.26
Primary education	207	2	29	167	9	X^2 (15, N = 936)	187.38
Secondary education	337	15	98	215	9	Significance level	<0.001
Higher education	192	14	123	46	9		
Vocational education	85	6	37	39	3		
Other level	51	2	26	20	3		
Experience years							
Less than 6	212	11	59	135	7	Cramer's V	0.09
Between 6 and 15	211	6	50	150	5	X^2 (9, N = 789)	18.19
Between 16 and 24	176	3	53	107	13	Significance level	0.03
More than 25	190	5	66	109	10		
Gender							
Female	641	28	197	383	33	Cramer's V	0.12
Male	295	12	124	150	9	X^2 (3, N = 936)	12.36
						Significance level	0.01
School type							
State-subsidized & private	138	7	66	60	5	Cramer's V	0.12
Public	798	33	255	473	37	X^2 (3, N = 936)	14.31
						Significance level	0.00
Students' Socioeconomic Status							
Low	266	8	67	180	11	Cramer's V	0.11
Intermediate low	291	10	107	157	17	X^2 (9, N = 919)	34.30
Intermediate high	197	13	64	114	6	Significance level	<0.001
High	165	9	79	71	6		

As shown in **Table 2**, there was a significant relationship between age, educational level, experience years, gender, school type, students' SES, and changes in student workload. Educational level was also more strongly related to the changes in student workload (largest Cramer's V). Teachers were more likely to provide a reduced workload if they were younger than 37 years old, worked in secondary education, had 6–15 years of experience, or had low SES students. In contrast, teachers were more likely to provide the same workload to their students if they worked in higher education, were older, most experienced, or had intermediate-low SES students. Female teachers and public-school teachers were more likely to provide the same or a reduced workload to students.

RQ2: Did Teachers' Well-Being Change, What Were the Challenges to Well-Being, and What Characteristics Influenced This Change?

We asked teachers about their well-being before and during ERT using a nine-point continuous scale (from very low to very high). We then compared both levels of perceived well-being in relation to teacher characteristics (**Table 3**). In this case, a non-parametric test (Wilcoxon rank-test) was chosen to determine whether the changes in teachers' perceived well-being were statistically significant, as the data did not show a normal distribution.

As indicated by the negative ranks in **Table 3**, most of the teachers declared that their perceived well-being diminished after ERT, and this decrease was significant ($Z = -19.59$, $p < 0.001$). A similar result was also identified for each of the teacher characteristics analyzed, as confirmed by the larger negative ranks and the statistically significant Wilcoxon rank tests shown in **Table 3**. As such, the teachers who reported the lowest perceived well-being were those aged between 38 and 45 years ($M = 4.94$, $SD = 2.27$), who worked in primary education ($M = 4.85$, $SD = 2.18$), whose years of experience were between 16 and 24 years ($M = 4.93$, $SD = 2.19$), who were female ($M = 5.08$, $SD = 2.15$), who taught in public schools ($M = 5.14$, $SD = 2.24$), or whose students came from low SES ($M = 4.83$, $SD = 2.14$).

We also asked teachers about the main challenges to their well-being during ERT. According to **Figure 3**, the main challenges were related to adapting to online teaching (34.17%), information and communication technologies (ICT) (10.05%),

TABLE 3 | Teachers' well-being before and after emergency remote teaching.

	N	Mean before	Mean after	Negative ranks	Positive ranks	Ties	Wilcoxon rank test	Significance level
Total	936	7.06 (2.07)	5.22 (2.21)	639	93	204	$Z = -19.59$	<0.001
Age								
Less than 37	242	7.14 (2.01)	5.42 (2.05)	163	30	49	$Z = -9.57$	<0.001
Between 38 and 45	237	7 (2.09)	4.94 (2.27)	161	22	54	$Z = -10.39$	<0.001
Between 46 and 54	249	7 (2.08)	5.12 (2.17)	183	21	45	$Z = -10.23$	<0.001
More than 55	207	7.16 (2.07)	5.43 (2.32)	132	20	55	$Z = -8.97$	<0.001
Educational level								
Early childhood	64	7.23 (2.08)	5.01 (2.28)	42	9	13	$Z = -5.30$	<0.001
Primary education	207	7.17 (1.99)	4.85 (2.18)	155	17	35	$Z = -9.94$	<0.001
Secondary education	337	7.08 (1.85)	5.36 (1.92)	237	43	57	$Z = -11.35$	<0.001
Higher education	192	6.69 (2.66)	5.26 (2.66)	112	13	67	$Z = -8.39$	<0.001
Vocational education	85	7.35 (1.65)	5.42 (2.09)	61	5	19	$Z = -6.46$	<0.001
Other level	51	7.19 (1.83)	5.52 (2.23)	32	6	13	$Z = -4.21$	<0.001
Experience years								
Less than 6	212	7.15 (1.9)	5.53 (2.02)	143	27	42	$Z = -8.65$	<0.001
Between 6 and 15	211	7.15 (1.86)	5.06 (2.02)	157	20	34	$Z = -10.08$	<0.001
Between 16 and 24	176	7.31 (1.82)	4.93 (2.19)	131	14	31	$Z = -9.51$	<0.001
More than 25	190	7.21 (1.75)	5.52 (2.01)	125	24	41	$Z = -8.15$	<0.001
Gender								
Female	641	7.09 (2.06)	5.08 (2.15)	459	61	121	$Z = -16.57$	<0.001
Male	295	7.02 (2.1)	5.51 (2.31)	180	32	83	$Z = -10.36$	<0.001
School type								
State-subsidized & Private	138	7.05 (1.89)	5.67 (1.97)	84	18	36	$Z = -6.73$	<0.001
Public	798	7.07 (2.11)	5.14 (2.24)	555	75	168	$Z = -18.38$	<0.001
Students' Socioeconomic Status								
Low	266	6.83 (2.21)	4.83 (2.14)	184	32	50	$Z = -10.31$	<0.001
Intermediate low	291	6.94 (2.24)	5.06 (2.35)	189	23	79	$Z = -11.00$	<0.001
Intermediate high	197	7.31 (1.78)	5.7 (2)	134	19	44	$Z = -8.98$	<0.001
High	165	7.36 (1.84)	5.47 (2.2)	120	15	30	$Z = -8.54$	<0.001

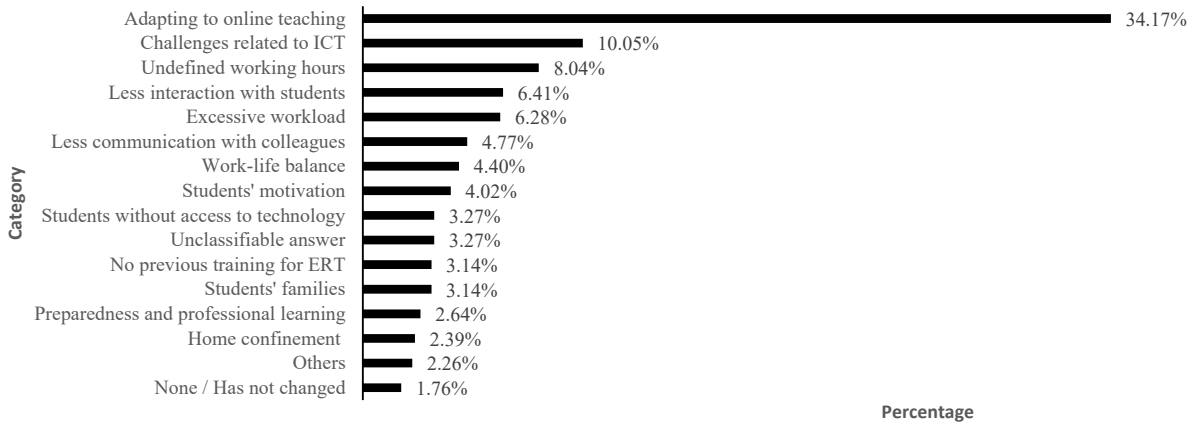


FIGURE 3 | Main challenges for teachers' well-being ($n = 796$). *Adapting to online teaching* includes reaching all students and teaching them efficiently (9.3%), remote teaching (5.15%), academic guidance and support (3.27%), lesson planning (2.39%), no teaching material (2.26%), coping uncertainty and stress (2.01%), providing/receiving feedback (2.01%), assessment (1.88%), working remotely (1.63%), excessive bureaucracy and paperwork (1.63%), nonconformity with lessons delivery (1.51%), and receiving students' low-quality work (1.13%). *Students' families* includes conflict with families (1.26%), criticism from families (1.01%), and adapting to families without resources (0.87%). *Home confinement* refers to not leaving home and isolation.

TABLE 4 | Changes in teachers' emotions during emergency remote teaching.

	More		Same		Less		Never have this feeling	
***Positive emotions* (*n* = 916)**	***N***	**Percentage**	***N***	**Percentage**	***N***	**Percentage**	***N***	**Percentage**
Happiness	44	4.8%	402	43.89%	458	50%	12	1.31%
Hope	177	19.32%	400	43.67%	321	35.04%	18	1.97%
Pride	279	30.46%	441	48.14%	145	15.83%	51	5.57%
Relief	67	7.31%	344	37.55%	417	45.52%	88	9.61%
***Negative emotions* (*n* = 916)**								
Anxiety	558	60.92%	225	24.56%	79	8.62%	54	5.9%
Nervousness	541	59.06%	255	27.84%	79	8.62%	41	4.48%
Shame	70	7.64%	412	44.98%	121	13.21%	313	34.17%
Sadness	396	43.23%	316	34.50%	93	10.15%	111	12.12%
Boredom	204	22.27%	264	28.82%	184	20.09%	264	28.82%

and the undefined working hours that blurred the boundaries between working hours and personal time (8.04%).

RQ3: Did Teachers' Emotions Change, and What Characteristics Influenced This Change?

We asked our participants whether their emotions had changed during ERT using four comparative options: more, same, less, and never have this feeling. **Table 4** displays their answers. Apparently, positive emotions decreased, as teachers reported lower levels of happiness (50%), hope (35.04%), and relief (45.52%). Conversely, there was an increase in negative emotions: more anxiety (60.92%), nervousness (59.06%), and sadness (43.23%). We then explored the relationship between several teacher characteristics and changes in their positive and negative emotions. The complete contingency tables for this analysis are available upon request, but the main results are summarized in **Table 5**.

Age was not significantly related to any positive emotion. In terms of the educational level, primary and secondary teachers were more likely to feel less happy and less relieved. Likewise, teachers with less than 6 years' experience were more likely to feel less happy. Women were more likely to feel less relieved than men. Teachers from public schools were more likely to feel less happy, similarly hopeful, and similarly proud. Finally, teachers whose students come from low SES were more likely to feel less happy, while teachers whose students came from low-intermediate SES were more likely to feel similarly hopeful and proud.

Regarding negative emotions, age was significantly related to anxiety, nervousness, sadness, and boredom. Teachers aged 37 years or less were more likely to feel more nervous, sad, and bored. In addition, respondents aged between 38 and 45 years were more likely to feel more anxious. In terms of educational level, primary and secondary teachers were more anxious, nervous, sad, and bored. In relation to years of experience, teachers with less than 15 years' experience were more likely to feel sad, while most experienced teachers were more likely never to feel bored. Female teachers were more likely to feel anxious, nervous, and sad. Public school teachers were more likely to feel anxious. Finally, teachers with low SES students were more likely to feel sad.

RQ4: What Was the Teachers' Motivational Level, Which Factors Affected It, and What Characteristics Influenced This Level?

We also asked teachers about their work motivation during ERT using a nine-point continuous scale (from very low to very high). The average teachers' motivation level was 5.68 (SD = 2.05). We then asked teachers about the factors influencing their level of motivation (**Figure 4**) and found that most reported factors were related to supporting students efficiently (23.61%), social interaction (9.09%), and teaching method (8.46%).

Subsequently, we determined whether teachers' work motivation differed across several of their characteristics through one-way ANOVA. Although the variable "work motivation" did not follow a normal distribution, the one-way ANOVA is robust against this assumption (Blanca et al., 2017). Levene's statistic was significant in all cases, thus fulfilling the assumption of homogeneity of variance. These results are provided in **Table 6**.

First, statistically significant differences were found in teachers' work motivation across educational level [$F(5,915) = 3.25$, $p = 0.01$]. A Tukey HSD *post-hoc* test revealed that the work motivation of higher education teachers ($M = 5.21$, $SD = 1.95$) was statistically significantly lower than the work motivation of secondary education ($M = 5.8$, $SD = 2.203$, $p = 0.03$) and vocational education ($M = 6.12$, $SD = 2.02$, $p = 0.01$) teachers.

Second, there were statistically significant differences in teachers' work motivation across gender [$F(1,919) = 4.88$, $p = 0.027$], with female teachers ($M = 5.57$, $SD = 2.06$) being less motivated about their work than male teachers ($M = 5.89$, $SD = 2$).

Finally, statistically significant differences in teachers' work motivation were identified across students' SES [$F(3,900) = 4.94$, $p = 0.00$]. A Tukey HSD *post-hoc* test suggested that the work motivation of teachers whose students come from intermediate-high SES conditions ($M = 6.14$, $SD = 1.87$) was statistically significantly higher than the work motivation of teachers whose

TABLE 5 | Teachers' positive and negative emotions during emergency remote teaching.

		Positive emotions				Negative emotions				
		Happiness	**Hope**	**Pride**	**Relief**	**Anxiety**	**Nervousness**	**Shame**	**Sadness**	**Boredom**
Age	Cramer's V	0.08	0.07	0.07	0.08	0.08	0.08	0.05	0.12	0.1
	X^2 (9, N = 916)	16.88	12.54	11.86	16.4	18.84	17.56	7.67	38.69	25.34
	Significance level	0.051	0.19	0.22	0.06	0.03	0.04	0.57	<0.001	0.00
	Interpretation	N.A.	N.A.	N.A.	N.A.	Teachers aged between 38 and 45 years are more likely to feel more anxious	Teachers aged 37 years or less are more likely to feel more nervous	N.A.	Teachers aged 37 years or less are more likely to feel sadder	Teachers aged 37 years or less are more likely to feel more bored
Educational level	Cramer's V	0.11	0.06	0.07	0.12	0.12	0.12	0.16	0.13	0.15
	X^2(15, N = 916)	34.78	8.57	14.84	37.62	36.91	40.98	67.68	46.76	57.86
	Significance level	0.03	0.9	0.46	0.00	0.00	<0.001	<0.001	<0.001	<0.001
	Interpretation	Primary and secondary teachers are more likely to feel less happy	N.A.	N.A.	Primary and secondary teachers are more likely to feel less relieved	Primary and secondary teachers are more likely to feel anxious	Primary and secondary teachers are more likely to feel nervous	Secondary teachers are more likely to never feel ashamed	Primary and secondary teachers are more likely to feel sad	Secondary teachers are more likely to never feel bored
Experience years	Cramer's V	0.11	0.05	0.08	0.05	0.07	0.08	0.05	0.1	0.11
	X^2 (9, N = 789)	27.94	4.88	15.44	5.70	10.70	16.38	6.07	22.55	27.02
	Significance level	0.00	0.85	0.08	0.77	0.3	0.06	0.73	0.01	0.00
	Interpretation	Teachers whose experience is less than 6 years are more likely to feel less happy	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	Teachers whose experience is less than 6 years and between 7 and 15 years are more likely to feel sad	Teachers whose experience is more than 25 years are more likely to never feel bored
Gender	Cramer's V	0.09	0.05	0.09	0.13	0.14	0.16	0.11	0.16	0.13
	X^2 (3, N = 916)	6.83	2.45	7.23	15.37	16.88	21.89	10.88	22.57	15.10
	Significance level	0.08	0.49	0.07	0.00	0.00	<0.001	0.01	<0.001	0.00
	Interpretation	N.A.	N.A.	N.A.	Women are more likely to feel less relieved	Women are more likely to feel anxious	Women are more likely to feel nervous	Women are more likely to feel similarly ashamed	Women are more likely to feel sad	Women are more likely to never feel bored
School type	Cramer's V	0.13	0.12	0.12	0.08	0.1	0.09	0.04	0.07	0.03
	X^2 (3, N = 916)	15.07	13.91	12.85	6.09	9.60	7.11	1.57	4.16	0.83
	Significance level	0.00	0.00	0.01	0.11	0.02	0.07	0.67	0.25	0.84

(Continued)

TABLE 5 | (Continued)

		Positive emotions				Negative emotions				
		Happiness	Hope	Pride	Relief	Anxiety	Nervousness	Shame	Sadness	Boredom
	Interpretation	Teachers from public schools are more likely to feel less happy	Teachers from public schools are more likely to feel similarly hopeful	Teachers from public schools are more likely to feel similarly proud	N.A.	Teachers from public schools are more likely to feel anxious	N.A.	N.A.	N.A.	N.A.
Students' Socioeconomic Status	Cramer's V	0.09	0.08	0.09	0.08	0.06	0.07	0.07	0.1	0.06
	X^2 (9, N = 899)	23.11	18.07	20.65	16.79	8.07	11.53	13.42	26.06	8.35
	Significance level	0.01	0.03	0.01	0.052	0.53	0.24	0.15	0.00	0.5
	Interpretation	Teachers whose students come from low SES are more likely to feel less happy	Teachers whose students come from intermediate low SES are more likely to feel similarly hopeful	Teachers whose students come from intermediate low SES are more likely to feel similarly proud	N.A.	N.A.	N.A.	N.A.	Teachers whose students come from low SES are more likely to feel sad	N.A.

students come from intermediate-low (M = 5.54, SD = 2.05, p = 0.00) and low SES conditions (M = 5.45, SD = 2.07, p = 0.00).

DISCUSSION

We investigated if and how ERT impacted teachers' well-being (RQ2), emotions (RQ3), and motivation (RQ4), while exploring if teacher characteristics influenced these effects. For a more complete analysis, we further investigated if teachers received training for the new context and if they changed their instructional strategies (RQ1), as these could have an impact on their workload and, therefore, their well-being, emotions, and motivation. Importantly, we do not know of any research in which such level of comparison among educational level and teacher characteristics among COVID-19 publications.

In regard to RQ1, the majority of teachers did not receive specific training for ERT, and half of those who did were not satisfied with it. Our results align with previous research that highlights the lack of preparation and support the teachers had received for providing quality teaching during ERT (Whalen, 2020; Zhang et al., 2020), as well as their lack of preparation for using adaptive learning activities in this new context (Troussas et al., 2021b). Additionally, the main instructional changes reported were less interaction with students and caring for the students affectively and socially. In particular, the teachers reported the need to acquire the pedagogical content knowledge to design and carry out meaningful experiences in a remote setting (Rapanta et al., 2020). Previous research has also found instructional changes, such as the majority of teachers changing or eliminating assignments or exams (de Boer, 2021) or they lowering their expectations regarding students' work (Johnson et al., 2020). The greatest challenge for university teachers was the importance of establishing affective connections with their students (Alvarez, 2020) as learning is not just about grades, it is also a matter of care and compassion (Bozkurt and Sharma, 2020). In this scenario, it was expected that teachers' well-being, emotions, and motivation would be affected and that teacher characteristics would mediate these effects.

Regarding how the teachers' characteristics influenced instructional changes, we found that female teachers, teachers working in secondary education, teachers of low SES students, or in public schools, were those who reported decreasing the instructional goals in their courses; while university teachers and those with students from intermediate-low SES maintained the pre-lockdown levels. Finally, younger teachers (under 37 years), with intermediate levels of experience (6–15 years), working in secondary education, or with students from low SES, reduced their students' workload. In contrast, the following types maintained the same workload: older teachers, those with more experience, university teachers, or those with students with intermediate-low SES.

Regarding teachers' well-being (RQ2), the participants massively reported a decrease compared to the previous period, which is in line with previous research (Alves et al., 2020). Levels of well-being were lower among a particular age range (38–45), for primary education teachers, those

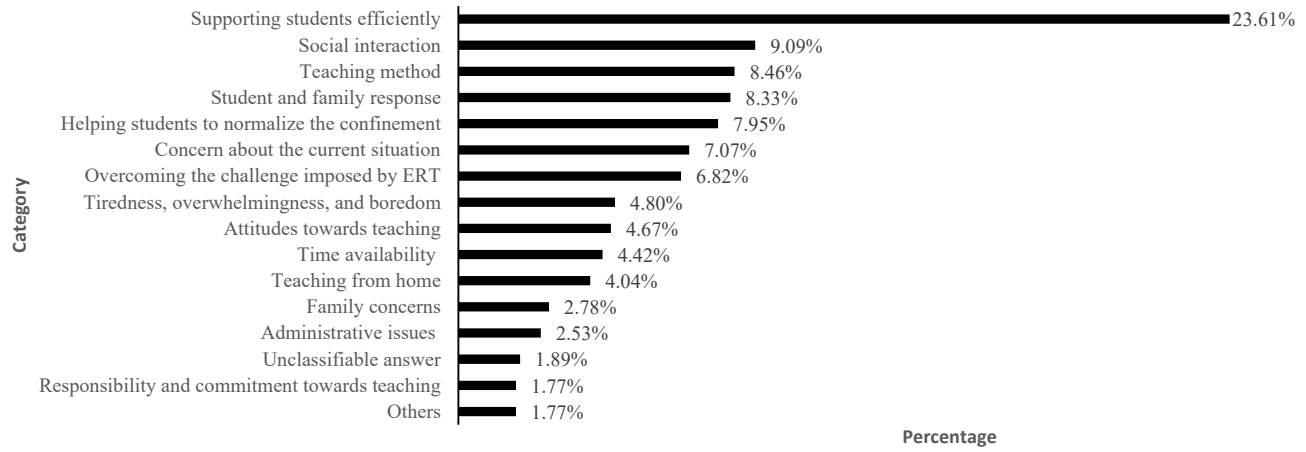


FIGURE 4 | Main factors influencing teachers' motivation levels (n = 792). *Social interaction* includes social contact (4.67%), isolation/confinement (1.64%), communication (1.39%), and interaction with colleagues (1.39%). *Teaching method* includes feelings about teaching (2.27%), impossibility to provide immediate feedback and appropriate guidance (1.77%), technological resources availability (1.52%), achieving teaching objectives (1.52%), and no preparation for facing ERT (1.38%).

TABLE 6 | ANOVA results for teachers' motivation during emergency remote teaching.

	N	Mean		Sum of squares	df	Mean square	*F*	Significance level
Age								
Less than 37	241	5.60 (2.06)	Between groups	18.87	3	6.29	1.52	0.21
Between 38 and 45	234	5.53 (2.06)	Within groups	3802.45	916	4.15		
Between 46 and 54	245	5.69 (2.07)	Total	3821.32	919			
More than 55	200	5.93 (1.91)						
Educational level								
Early childhood	64	5.54 (2.02)	Between groups	67.24	5	13.45	3.25	0.01
Primary education	207	5.63 (2.09)	Within groups	3786.34	915	4.14		
Secondary education	336	5.8 (2.03)	Total	3853.58	920			
Higher education	178	5.21 (1.95)						
Vocational education	85	6.12 (2.02)						
Other level	51	6.01 (2.09)						
Experience years								
Less than 6	212	5.74 (2.01)	Between groups	31.66	3	10.55	2.54	0.06
Between 6 and 15	211	5.56 (2.03)	Within groups	3258.56	785	4.15		
Between 16 and 24	176	5.75 (2.1)	Total	3290.23	788			
More than 25	190	6.11 (2)						
Gender								
Female	632	5.57 (2.06)	Between groups	20.34	1	20.34	4.88	0.03
Male	289	5.89 (2)	Within groups	3833.24	919	4.17		
			Total	3853.58	920			
School type								
State-subsidized & Private	138	5.76 (1.91)	Between groups	1.16	1	1.16	0.28	0.6
Public	783	5.66 (2.07)	Within groups	3852.42	919	4.19		
			Total	3853.58	920			
Students' Socioeconomic Status								
Low	264	5.45 (2.07)	Between groups	61.31	3	20.44	4.94	0.00
Intermediate low	281	5.54 (2.05)	Within groups	3722.37	900	4.14		
Intermediate high	195	6.14 (1.87)	Total	3783.68	903			
High	164	5.7 (2.1)						

with longer experience (16–24 years), females, public schools, and students from low SES. Regarding gender differences, family-related time use and caring responsibilities appear to play a role (Etheridge and Spantig, 2020; Klapproth et al., 2020); however, there are some inconsistencies in the scientific literature regarding the relationship between gender and well-being (Alves et al., 2020), because the gender variable is a predictor of professional well-being: sometimes from a positive perspective (female teachers are more satisfied), sometimes from a negative perspective (male teachers are more satisfied) and other times it is not a significant predictor. Some studies have also discussed innovative instructional factors such as reinforcing teacher self-efficacy and, in turn, teacher well-being (Hascher et al., 2021). However, in this study, interestingly, the main challenges were either with instructional factors or technology, showing that teachers struggled to deliver their courses in the new learning environment. This aligns with previous research by Duraku and Hoxha (2020) who found that an insufficient level of skills and knowledge related to the use of technology created anxiety, overload, insecurity, stress, and job dissatisfaction to teachers. One possible intervention suggested by Anderson et al. (2021) is training teachers in a growth mindset as this might be positive for their well-being, which is necessary to offer student-centered learning opportunities (e.g., using interactive software to communicate with peers, exchange ideas, and collaborate) (Troussas et al., 2021a).

Regarding teachers' emotions (RQ3), a less explored variable in ERT, the data unequivocally showed that teachers experienced fewer positive emotions and more negative emotions, especially among teachers in primary and secondary education, teachers with less than 6 years of experience, women, teachers from public schools and teachers whose students come from low SES. These results are in line with previous research showing teachers' resilience and level of burnout were significantly correlated with their attitudes toward technology (Sokal et al., 2020), and teachers experiencing strong emotions such as the fear of getting sick or losing their job (Dayal and Tiko, 2020). Furthermore, students from lower SES backgrounds and those whose parents have lower levels of education are statistically less likely to obtain resources from their teachers or to use educational apps (Doyle, 2020).

Finally, when it comes to teachers' motivation (RQ4), also an aspect not as frequently explored as well-being, our participants' motivation was low, reporting factors such as worrying about students' well-being, the impact on their learning process and in the interactions among teachers and students, and how the lockdown was affecting the students and their families. Interestingly, female and higher education teachers reported less motivation, as well as teachers with students in intermediate-low and low SES. Previous research found that the job motivation of university teachers was lower during ERT than before the pandemic, especially for teachers with a negative opinion of university management (Kulikowski et al., 2021b). Higher education teachers' motivation came from factors that were missing during remote teaching: the perceived relationship with the students and the impact of their instruction on academic development (Han and Yin, 2016; Moorhouse and Kohnke, 2021). In terms of gender, previous studies have tended to indicate higher levels of stress and anxiety in women (Casimiro-Urcos et al., 2020; Hayes et al., 2020; Taylor et al., 2020), which might be connected to their time-consuming activities such as childcare and unpaid domestic labor, among others (Jelińska and Paradowski, 2021).

PRACTICAL IMPLICATIONS AND LIMITATIONS

Next, we explore the practical implications for the teachers groups we found to be more affected. First, the major detriment to female teachers is a global challenge, which might be related to higher responsibilities in domestic labor and childcare, plus having a higher number of women in primary and secondary education where students were more likely to struggle to keep up with the pace of learning during ERT. Societal interventions are needed to ensure better conditions for female teachers. Second, teachers in public schools and with low SES students have struggled most, probably because of a mix of the students having less experience and access to technological resources plus more constrains and challenges at home, such as shared rooms or lack of internet connection. It is crucial, if we want equalitarian learning opportunities, that we address these deficiencies by investing more resources to offer equal opportunities. Third, our results showed that primary and secondary school teachers were more affected, probably because they work with less mature students and they also have limited experience using online systems in their learning (e.g., learning management systems). The younger the student, the more attention they would require, thus adding workload to teachers who were already struggling with the new situation.

Regarding the limitations of our study, our data come from a survey, which may thus be affected by the usual risks of self-report; however, the variables we explored here are usually measured through self-report, as they evaluate the internal perceptions of the participants. Participation was also voluntary, so our results only report the characteristics of the teachers who felt motivated to participate.

CONCLUSION

In conclusion, our study shows that ERT imposed instructional constraints and added pressure on teachers at all levels, decreasing the well-being, positive emotions, and motivation of teachers while increasing negative emotions. Importantly, not all teachers were affected equally, with female teachers, teachers with students from low SES, those teaching in public schools, and primary and secondary teachers as the most affected groups. This indicates that the impact of the switch to ERT differs, and some populations of teachers are more at risk of suffering burnout if ERT continues. The COVID-19 lockdowns have stressed society, and our teachers, as crucial actors, have suffered a considerable impact. We need to provide better solutions if we are to go back to ERT, as some countries are returning to strict

lockdowns (e.g., Austria in November 2021). It is our hope that this study can shed light on what areas are most important to address and ways of identifying the most vulnerable teachers.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

EP, JF, and LP performed the instrument design and data collection. CR-H performed the data analysis. EP, EB, JF, FD, LP, and CR-H contributed to the literature review and wrote the manuscript, in decreasing order of participation in writing.

FUNDING

This study was supported by (1) Spanish National R + D call from the Ministerio de Ciencia, Innovación y Universidades (Generación del conocimiento 2020), Reference number PID2019-108982GB-I00 and (2) Universidad Francisco de Vitoria Call for Research in Educational Innovation 2020, Reference number UFV2020-46.

REFERENCES

Alvarez, A. J. (2020). The phenomenon of learning at a distance through emergency remote teaching amidst the pandemic crisis. *Asian J. Dis. Edu.* 15, 144–153. doi: 10.5281/zenodo.3881529

Alves, R., Lopes, T., and Precioso, J. (2020). Teachers' well-being in times of Covid-19 pandemic: factors that explain professional well-being. *IJERI: Int. J. Edu. Res. Innov.* 15, 203–217. doi: 10.46661/ijeri.5120

Anderson, R. C., Bousselot, T., Katz-Buoincontro, J., and Todd, J. (2021). Generating buoyancy in a sea of uncertainty: Teachers creativity and well-being during the COVID-19 pandemic. *Front. Psychol.* 11:614774. doi: 10.3389/fpsyg.2020.614774

Aypay, A. (2009). Teachers' evaluation of their pre-service teacher training. *Edu. Sci. Theory Pract.* 9, 1113–1123.

Beausaert, S., Froehlich, D. E., Riley, P., and Gallant, A. (2021). What about school principals' well-being? The role of social capital. *Edu. Manag. Admin. Leadersh.* 2021:853. doi: 10.1177/1741143221991853

Bermejo-Toro, L., Prieto-Ursúa, M., and Hernández, V. (2016). Towards a model of teacher well-being: personal and job resources involved in teacher burnout and engagement. *Edu. Psychol.* 36, 481–501. doi: 10.1080/01443410.2015.1005006

Blanca, M. J., Alarcón, R., Arnau, J., Bono, R., and Bendayan, R. (2017). Non-normal data: Is ANOVA still a valid option? *Psicothema* 29, 552–557. doi: 10.7334/psicothema2016.383

Bozkurt, A., and Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian J. Dist. Edu.* 15, 1–6. doi: 10.5281/zenodo.3778083

Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., et al. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian J. Dist. Edu.* 15, 1–126. doi: 10.5281/zenodo.3878572

Butler, R., and Shibaz, L. (2008). Achievement goals for teaching as predictors of students' perceptions of instructional practices and students' help seeking and cheating. *Learn. Instruc.* 18, 453–467. doi: 10.1016/j.learninstruc.2008.06.004

Casimiro-Urcos, W. H. C., Casimiro-Urcos, C. N., Barbacharán-Ruales, E. A., and Casimiro-Urcos, J. F. (2020). Stress, anguish, anxiety and resilience of university teachers in the face of Covid-19. *Utopía y Praxis Latinoamericana* 25, 453–464. doi: 10.5281/zenodo.4009790

Chan, M. K., Sharkey, J. D., Lawrie, S. I., Arch, D. A. N., and Nylund-Gibson, K. (2021). Elementary school teacher well-being and supportive measures amid COVID-19: An exploratory study. *Sch. Psychol.* 36, 533–545. doi: 10.1037/spq0000441

Chang, M. L. (2009). An appraisal perspective of teacher burnout: Examining the emotional work of teachers. *Edu. Psychol. Rev.* 21, 193–218. doi: 10.1007/s10648-009-9106-y

Clark, S., McGrane, A., Boyle, N., Joksimovic, N., Burke, L., Rock, N., et al. (2021). "You're a teacher you're a mother, you're a worker": Gender inequality during COVID-19 in Ireland. *Gend. Work Organ.* 28, 1352–1362. doi: 10.1111/gwao.12611

Collie, R. J., Shapka, J. D., Perry, N. E., and Martin, A. J. (2015). Teacher well-being: Exploring its components and a practice-oriented scale. *J. Psychoedu. Assess.* 33, 744–756. doi: 10.1177/0734282915587990

Day, C., and Qing, G. (2009). "Teacher emotions: Well being and effectiveness," in *Advances in Teacher Emotion Research*, eds P. Schutz and M. Zembylas (New York, NY: Springer), 15–31. doi: 10.1007/978-1-4419-0564-2_2

Dayal, H. C., and Tiko, L. (2020). When are we going to have the real school? A case study of early childhood education and care teachers' experiences surrounding education during the COVID-19 pandemic. *Aust. J. Early Childhood* 45, 336–347. doi: 10.1177/1836939120966085

de Boer, H. (2021). COVID-19 in Dutch higher education. *Stud. High. Edu.* 46, 96–106. doi: 10.1080/03075079.2020.1859684

Doyle, O. (2020). *COVID-19: Exacerbating educational inequalities*. Dublin: Geary Institute for Public Policy.

Duraku, Z. H., and Hoxha, L. (2020). The impact of COVID-19 on education and on the well-being of teachers, parents, and students: Challenges related to remote (online) learning and opportunities for advancing the quality of education. https://www.researchgate.net/publication/341297812 (accessed July 5, 2021).

Etheridge, B., and Spantig, L. (2020). *The gender gap in mental well-being during the Covid-19 outbreak: Evidence from the UK (Working Paper Series)*. Colchester: University of Essex.

Fives, H., and Buehl, M. M. (2016). "Teacher motivation: Self-efficacy and goal orientation," in *Handbook of motivation at school*, eds K. R. Wentzel and D. B. Miele (Abingdon: Routledge), 352–372.

Frenzel, A. C. (2014). "Teacher emotions," in *International Handbook of Emotions in Education* 1st ed, eds E. A. Linnenbrink-Garcia and R. Pekrun (Abingdon: Routledge), 494–519.

Frenzel, A. C., Daniels, L., and Burić, I. (2021). Teacher emotions in the classroom and their implications for students. *Edu. Psychol.* 56, 250–264. doi: 10.1080/00461520.2021.1985501

Hakanen, J. J., Bakker, A. B., and Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *J. Sch. Psychol.* 43, 495–513. doi: 10.1016/j.jsp.2005.11.001

Han, J., and Yin, H. (2016). Teacher motivation: Definition, research development and implications for teachers. *Cog. Edu.* 3:1217819. doi: 10.1080/2331186X.2016.1217819

Hascher, T., Beltman, S., and Mansfield, C. (2021). Swiss primary teachers' professional well-being during school closure due to the COVID-19 pandemic. *Front. Psychol.* 12:687512. doi: 10.3389/fpsyg.2021.687512

Hayes, S. W., Priestley, J. L., Ishmakhametov, N., and Ray, H. E. (2020). I'm not working from home, I'm living at work": perceived stress and work-related burnout before and during COVID-19. *PsyArXiv* doi: 10.31234/osf.io/vnkwa

Hodges, C., Moore, S., Lockee, B., Trust, T., and Bond, A. (2020). *The difference between emergency remote teaching and online learning*. Boulder: Educause.

Jelińska, M., and Paradowski, M. B. (2021). Teachers' engagement in and coping with emergency remote instruction during COVID-19-induced school closures: A multinational contextual perspective. *Online Learn.* 25, 303–328. doi: 10.24059/olj.v25i1.2492

Johnson, N., Veletsianos, G., and Seaman, J. (2020). U.S. faculty and administrators' experiences and approaches in the early weeks of the COVID-19 pandemic. *Online Learn.* 24, 6–21. doi: 10.24059/olj.v24i2.2285

Juniper, B. (2011). Defining employee wellbeing. *Occup. Health* 63:25.

Kanetaki, Z., Stergiou, Z., Troussas, C., and Sgouropoulou, C. (2021). "Development of an innovative learning methodology aiming to optimise learners' spatial conception in an online mechanical CAD module during COVID-19 pandemic," in *Novelties in Intelligent Digital Systems*, eds C. Frasson, K. Kabassi, and A. Voulodimos (Amsterdam: IOS Press), 31–39. doi: 10.3233/FAIA210072

Khanal, L. P., Bidari, S., and Nadif, B. (2021). Teachers' (de)motivation during COVID-19 pandemic: A case study from Nepal. *Int. J. Ling., Literat. Transl.* 4, 82–88. doi: 10.32996/ijllt.2021.4.6.10

Klapproth, F., Federkeil, L., Heinschke, F., and Jungmann, T. (2020). Teachers' experiences of stress and their coping strategies during COVID-19 induced distance teaching. *J. Pedag. Res.* 4, 444–452. doi: 10.33902/JPR.2020062805

Krouska, A., Troussas, C., and Sgouropoulou, C. (2022). Mobile game-based learning as a solution in COVID-19 era: Modeling the pedagogical affordance and student interactions. *Edu. Inform. Technol.* 27, 229–241. doi: 10.1007/s10639-021-10672-3

Kulikowski, K., Przytuła, S., and Sułkowski, L. (2021a). E-learning? Never again! On the unintended consequences of COVID-19 forced e-learning on academic teacher motivational job characteristics. *High. Edu. Quart.* 76, 174–189. doi: 10.1111/hequ.12314

Kulikowski, K., Przytuła, S., and Sułkowski, L. (2021b). The motivation of academics in remote teaching during the Covid-19 pandemic in polish universities—Opening the debate on a new equilibrium in e-learning. *Sustainability* 13:2752. doi: 10.3390/su13052752

Kumpikaitė-Valiūnienė, V., Duobienė, J., Liubinienė, V., Kasperiūnienė, J., and Tandzegolskienė, I. (2021). The impact of institutional support on educators' subjective well-being during transition to virtual work due to COVID-19 lockdown. *J. Manag. Org.* 27, 1150–1168. doi: 10.1017/jmo.2021.60

MacIntyre, P. D., Gregersen, T., and Mercer, S. (2020). Language teachers' coping strategies during the Covid-19 conversion to online teaching: Correlations with stress, wellbeing and negative emotions. *System* 94:102352. doi: 10.1016/j.system.2020.102352

Marks, H. M., and Louis, K. S. (1997). Does teacher empowerment affect the classroom? The implications of teacher empowerment for instructional practice and student academic performance. *Edu. Eval. Policy Anal.* 19, 245–275. doi: 10.3102/01623737019003245

Moorhouse, B. L., and Kohnke, L. (2021). Thriving or surviving emergency remote teaching necessitated by COVID-19: university teachers' perspectives. *Asia-Pacific Edu. Res.* 30, 279–287. doi: 10.1007/s40299-021-00567-9

Nabe-Nielsen, K., Fuglsang, N. V., Larsen, I., and Nilsson, C. J. (2021). COVID-19 risk management and emotional reactions to COVID-19 Among school teachers in Denmark: Results from the class study. *J. Occup. Environ. Med.* 63, 357–362. doi: 10.1097/JOM.0000000000002136

Ozamiz-Etxebarria, N., Berasategi, N., Idoiaga, N., and Dosil, M. (2021). The psychological state of teachers during the COVID-19 crisis: The challenge of returning to face-to-face teaching. *Front. Psychol.* 11:3861. doi: 10.3389/fpsyg.2020.620718

Panisoara, I. O., Lazar, I., Panisoara, G., Chirca, R., and Ursu, A. S. (2020). Motivation and continuance intention towards online instruction among teachers during the COVID-19 pandemic: The mediating effect of burnout and technostress. *Int. J. Environ. Res. Public Health* 17:8002. doi: 10.3390/ijerph17218002

Postholm, M. B. (2012). Teachers' professional development: a theoretical review. *Edu. Res.* 54, 405–429. doi: 10.1080/00131881.2012.734725

Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., and Koole, M. (2020). Online university teaching during and after the Covid-19 crisis: Refocusing teacher presence and learning activity. *Postdigi. Sci. Edu.* 2, 923–945. doi: 10.1007/s42438-020-00155-y

Sokal, L., Eblie, L., and Babb, J. (2020). Canadian teachers' attitudes toward change, efficacy, and burnout during the COVID-19 pandemic. *Int. J. Edu. Res. Open* 1:100016. doi: 10.1016/j.ijedro.2020.100016

Sutton, R., and Wheatley, K. (2003). Teachers' emotions and teaching: A review of the literature and directions for future research. *Edu. Psychol. Rev.* 15, 327–358. doi: 10.1023/a:1026131715856

Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D., and Asmundsoon, G. J. G. (2020). COVID stress syndrome: Concept, structure, and correlates. *Depress. Anx.* 37, 706–714. doi: 10.1002/da.23071

Tejedor, S., Cervi, L., Pérez-Escoda, A., Tusa, F., and Parola, A. (2021). Higher education response in the time of coronavirus: perceptions of teachers and students, and open innovation. *J. Open Innov. Technol. Market Compl.* 7:43. doi: 10.3390/joitmc7010043

Troussas, C., Krouska, A., Giannakas, F., Sgouropoulou, C., and Voyiatzis, I. (2021a). "An alternative educational tool through interactive software over Facebook in the era of COVID-19," in *Novelties in intelligent digital systems. Proceedings of the* 1*st International Conference (NIDS* 2021*)*, eds C. Frasson, K. Kabassi, and A. Voulodimos (Athens: IOS Press), 3–11.

Troussas, C., Krouska, A., and Sgouropoulou, C. (2021b). A novel teaching strategy through adaptive learning activities for computer programming. *IEEE Trans. Edu.* 64, 103–109. doi: 10.1109/TE.2020.3012744

Watt, H. M. G., and Richardson, P. W. (2015). "Teacher motivation," in *International encyclopedia of the social & behavioral sciences*, ed. J. D. Wright (Amsterdam: Elsevier), 64–71. doi: 10.1016/B978-0-08-097086-8.26082-0

Whalen, J. (2020). Should teachers be trained in emergency remote teaching? Lessons learned from the COVID-19 pandemic. *J. Technol. Teach. Edu.* 28, 189–199.

Zhang, W., Wang, Y., Yang, L., and Wang, C. (2020). Suspending classes without stopping learning: China's education emergency management policy in the COVID-19 outbreak. *J. Risk Financ. Manag.* 13, 1–6. doi: 10.3390/jrfm13030055

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2022 Panadero, Fraile, Pinedo, Rodríguez-Hernández, Balerdi and Díez. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

frontiers | Frontiers in Psychology

ORIGINAL RESEARCH
published: 12 May 2022
doi: 10.3389/fpsyg.2022.861300

Profiles of Work Engagement and Work-Related Effort and Reward Among Teachers: Associations to Occupational Well-Being and Leader–Follower Relationship During the COVID-19 Pandemic

Sanni Pöysä[1], Eija Pakarinen[1] and Marja-Kristiina Lerkkanen[1,2]*

[1]Department of Teacher Education, University of Jyväskylä, Jyväskylä, Finland, [2]Norwegian Centre for Learning Environment and Behavioural Research in Education, University of Stavanger, Stavanger, Norway

OPEN ACCESS

Edited by:
Eva Kyndt,
Swinburne University of Technology, Australia

Reviewed by:
Alberto Crescentini,
University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Switzerland
Dominik E. Froehlich,
University of Vienna, Austria

***Correspondence:**
Sanni Pöysä
sanni.poysa@jyu.fi

Specialty section:
This article was submitted to Organizational Psychology, a section of the journal Frontiers in Psychology

Received: *24 January 2022*
Accepted: *19 April 2022*
Published: *12 May 2022*

Citation:
Pöysä S, Pakarinen E and Lerkkanen M-K (2022) Profiles of Work Engagement and Work-Related Effort and Reward Among Teachers: Associations to Occupational Well-Being and Leader–Follower Relationship During the COVID-19 Pandemic. Front. Psychol. 13:861300. doi: 10.3389/fpsyg.2022.861300

This study examined teachers' occupational well-being by identifying profiles based on teachers' self-ratings of work engagement as well as work-related effort and reward. It also did so by examining whether the identified subgroups differed with respect to teachers' self-reported occupational stress and emotional exhaustion as well as with respect to work-related resources such as the individual resource of work meaningfulness and the leader-level resource of the leader–follower relationship. The participants in the study were 321 Finnish elementary school teachers. The data were collected in spring 2021, that is, at the time when the COVID-19 pandemic was present, yet there were no national school closures. Three groups of teachers were identified with latent profile analysis: (1) teachers recognized as being poorly engaged with the highest effort and lowest reward (4.7%); (2) teachers recognized as being averagely engaged with higher effort than reward (32.1%); and (3) teachers recognized as being highly engaged with higher reward than effort (63.2%). The subsequent analyses examining the differences among the profile groups revealed, for example, that each profile group differed with respect to the individual resource of work meaningfulness and profile groups 2 and 3 differed with respect to the leader-level resource of the leader–follower relationship. Thus, the findings indicate that there are differences in the ways in which teachers are able to benefit from the work-related resources and how they cope with job-related demands during the COVID-19 pandemic.

Keywords: work engagement, effort and reward, occupational well-being, work meaningfulness, leader–follower relationship

INTRODUCTION

Teaching is known to be a highly demanding job (Kyriacou, 2001; Johnson et al., 2005), and there has been an increasing interest in teachers' occupational well-being in educational research, especially during the COVID-19 pandemic. The existing literature has shown that occupational well-being has both positive and negative aspects (e.g., Bermejo-Toro et al., 2016; Cumming,

2017). Different negative aspects, such as experiences of work-related stress and emotional exhaustion, diminish teachers' occupational well-being (e.g., Montgomery and Rupp, 2005; Foley and Murphy, 2015), while positive aspects, such as experiences of work engagement or work-related rewards, may strengthen their well-being (e.g., Van Vegchel et al., 2005; Bakker et al., 2007). However, as the existing studies have highlighted that teachers' occupational well-being is individually constructed (e.g., Herman et al., 2018; Aulén et al., 2021), there are differences in the ways in which teachers' well-being is built on the basis of different negative and positive aspects of occupational well-being.

Based on previous literature, a balance between work-related effort and reward, as well as between demands and resources, is particularly important for a sense of occupational well-being (e.g., Van Vegchel et al., 2005; Hakanen et al., 2006). This balance is perhaps not easily achieved or maintained as teachers' work is determined by inherent changes that occur, for example, in myriad social interactions central to the occupation. Moreover, the last few years with the COVID-19 pandemic have shown that the educational field may also face such unexpected and relatively massive changes (UNESCO, UNICEF, and the World Bank, 2020), which may have an effect on teachers' occupational well-being (e.g., Chan et al., 2021). In order to gain a deeper understanding on teachers' occupational well-being, there is an evident need to examine the possible differences in their well-being during the COVID-19 pandemic. Such understanding would help teachers, researchers, and policy makers to better prepare for the future crises and other unexpected changes which can undermine teachers' occupational well-being. For example, the knowledge gained with respect to different resources that could be endorsed as a source of focused support for teachers' occupational well-being is important for both, practice and theory, during the pandemics and beyond.

To address the gaps in the previous literature, the present study was conducted by recognizing that teachers' occupational well-being is individually constructed and by examining both positive and negative aspects related to occupational well-being simultaneously with the data collected during the COVID-19 pandemic. A person-oriented approach was utilized to identify subgroups of teachers based on their experiences of work engagement and work-related effort and reward. The subgroups were subsequently analyzed to examine whether they would differ, for example, with respect to teachers' self-reported occupational stress and emotional exhaustion and with respect to teachers' experience of their work meaningfulness or leader–follower relationships.

TEACHERS' WORK ENGAGEMENT AND OCCUPATIONAL WELL-BEING

Across different occupations, the experience of being engaged with work is seen to be positively related to the experiences of occupational well-being (e.g., Schaufeli and Taris, 2014). This could be explained with the view of Schaufeli et al. (2006) that engaged employees have a sense of being effectively and energetically connected with their work-related activities, and they have a sense of ability to deal with their work-related demands. While the concept of work engagement can be approached *via* several different types of conceptualizations (see Christian et al., 2011; Perera et al., 2018), the definition that is perhaps the most acknowledged is drawn by Schaufeli et al. (2002). It defines work engagement as "a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption" (74). Based on previous literature (Schaufeli et al., 2002; Schaufeli and Salanova, 2013), teachers' experience of vigor means that they have high levels of energy and mental resilience while working, are willing to invest effort in their work, and are persistent in the face of difficulties. Teachers' experience of dedication, in turn, means that they are strongly involved with their work, and they have a sense of significance, enthusiasm, inspiration, pride, and challenge with respect to their work. Finally, teachers' experience of absorption means that they are fully concentrated and happily engrossed in their work in such a way that time passes quickly while working.

According to the Job Demands-Resources (JD-R) Model (Demerouti et al., 2001), an experience of work engagement is built on the presence of job-related resources (see, e.g., Schaufeli and Taris, 2014; Lesener et al., 2020). The JD-R model does not determine what the resources specifically are, but previous literature has suggested that different resources can be identified within the individual or at multiple levels of the organization (i.e., group level, leader level, and organizational level; e.g., Nielsen et al., 2017). Individual resources are, for example, personal characteristics, such as self-efficacy and competence, or a sense of work's meaningfulness, which helps a worker to cope with the demands of the job (Geldenhuys et al., 2014; Nielsen et al., 2017; Minkkinen et al., 2020). Group-level and leader-level resources, in turn, are different forms of social capital embedded in relationships among actors, as group-level resources are, for example, social support and good relationships between employees, while leader-level resources are, for example, leadership characteristics and the quality of leader–follower relationships (Christian et al., 2011; Nielsen et al., 2017; Lesener et al., 2020). The organizational-level resources are, for example, the way in which the work is organized, designed, and managed (Nielsen et al., 2017). Resources related to each of these three levels of organization are known to predict work engagement over time (Lesener et al., 2020).

Previous research has recognized different job resources, such as experiences of self-efficacy, supervisory support, and supportive colleagues, which are connected to teachers' work engagement (e.g., Hakanen et al., 2006; Simbula et al., 2010). Such resources are important because they not only boost teachers' work engagement but are also positively related to their occupational well-being in general (e.g., Collie and Martin, 2017). From the perspective of the JD-R model, occupational well-being is seen as drawing upon a balance between positive and negative job characteristics, where the positive job characteristics are different job resources, while the negative job characteristics are the demands that are typical for a specific occupation (Schaufeli and Taris, 2014). Based on

previous research, the demands within the teaching profession include, for example, experiences of time pressure and excessive workloads (Hakanen et al., 2006; Skaalvik and Skaalvik, 2018).

Along with its role in the JD-R model, a balance between job-related demands and resources is acknowledged as crucial for occupational well-being in other theoretical models as well. The Effort–Reward Imbalance (ERI) model (Siegrist, 1996; Siegrist et al., 2004), for instance, posits that an imbalance between high effort and low reward may lead to increased work stress and decreased occupational well-being. In the ERI model, effort is seen to be constituted of extrinsic demands of the job and an individual's intrinsic motivations in demanding situations (Siegrist, 1996), that is, different job demands and obligations that are imposed upon an individual (Van Vegchel et al., 2005). Reward, in turn, captures occupational gratifications in terms of salary, esteem, and career opportunities (Siegrist, 1996). Previous research examining teachers' occupational well-being by using measures operationalized on the basis of the ERI model determined that teachers' experiences of high levels of effort and low levels of reward as well as an effort–reward imbalance are related to their experiences of burnout (Unterbrink et al., 2007; Wang et al., 2015) as well as with their decreased physical (Bellingrath et al., 2010) and mental health (Hinz et al., 2014).

The previous literature shows that teachers' occupational well-being is an indisputably complex phenomenon. Both theoretical models and empirical evidence indicate that occupational well-being is drawn from different positive and negative aspects (e.g., Van Vegchel et al., 2005; Schaufeli and Taris, 2014; Bermejo-Toro et al., 2016). For example, teaching is recognized as a highly stressful occupation (Kyriacou, 2001; Johnson et al., 2005), and when compared with other occupations, teachers' stress seems to be higher than average (Johnson et al., 2005; Travers, 2017). However, despite being a highly stressful occupation, teachers' work engagement was found to be relatively high even when measured during the first few months of the COVID-19 pandemic (e.g., Salmela-Aro et al., 2019; Pöysä et al., 2021). Thus, it is reasonable to approach teachers' occupational well-being by recognizing the simultaneous presence of different negative and positive aspects related to well-being during the ongoing pandemic. Moreover, as increasing evidence has indicated that teachers' occupational well-being is individually constructed, it might be that the complexity of teachers' occupational well-being leads to an evident need to adapt statistical methods that take such complexity into consideration and examine teachers without seeing them as a homogeneous group.

TEACHERS' OCCUPATIONAL WELL-BEING DURING THE COVID-19 PANDEMIC

In spring 2020, the COVID-19 pandemic resulted in unexpected and severe disruptions in the field of education. Since the beginning of the pandemic, there have been school closures around the globe, and by the end of September 2021, there were up to 27% of countries where the schools were still fully or partially closed (UNICEF, 2021). While Finland and many other Western countries were able to keep the schools mostly open or at least partially open in the academic year of 2020–2021 (UNESCO, 2021), the pandemic resulted in certain restrictions that affected daily schooling (Ministry of Education and Finnish Institute for Health and Welfare, 2020; see also UNESCO, UNICEF, the World Bank, the World Food Programme, and UNHCR, 2021). Schools have been guided, for example, to ensure that there are no unnecessary physical contacts between teachers and between students (Ministry of Education and Finnish Institute for Health and Welfare, 2020). In addition, teachers and students have not been allowed to go to school if they have even the slightest symptoms of flu (Ministry of Education and Finnish Institute for Health and Welfare, 2020); thus, teachers have needed to support the learning of both students at school and those at home.

The field of education has shared a reasonable concern about teachers' occupational well-being during the COVID-19 pandemic. The number of studies examining teachers' well-being at the time of school closures has been increasing. Most of the existing findings thus far have suggested that teachers experienced substantial levels of occupational stress during the spring of 2020 (e.g., MacIntyre et al., 2020), yet there are also some contradictory findings (Herman et al., 2021). Nevertheless, based on the prevalence of acute stress symptoms, Zhou and Yao (2020) suggested that teachers had relatively serious acute stress symptoms at the beginning of the pandemic, and, for example, Chan et al. (2021) and Pöysä et al. (2021) have shown that teachers' experiences of occupational stress were positively related to their emotional exhaustion during that time. Moreover, previous studies have recognized that the beginning of the pandemic resulted in stressors specifically related to the situation (e.g., Kim and Asbury, 2020; MacIntyre et al., 2020); thus, it is possible that teachers' experiences of job-related demands increased due to the COVID-19 pandemic.

Along with focusing on the negative aspects related to occupational well-being, the existing literature provides some suggestions as to which factors may have supported teachers' well-being at the time of school closures. Such factors can be recognized with respect to individuals as well as to different levels of organization. For example, Herman et al. (2021) found that teachers' sense of confidence in managing student behavior in online settings predicted teachers' stress negatively. MacIntyre et al. (2020), in turn, have found that teachers' usage of approach coping strategies (i.e., strategies that aim to change or actively accept the stressor) was related to positive well-being experiences, while usage of avoidant coping strategies was related to stress and other negative emotions. The existing literature does not provide a view on how teachers' individual resources of work meaningfulness could have been related to teachers' occupational well-being during the COVID-19 pandemic. However, based on a study by Minkkinen et al. (2020) that suggested that a sense of meaningful work protects teachers' well-being under stressors, it could be expected that a sense of work's

meaningfulness might have been crucial, especially during the pandemic.

With respect to different levels of organization, social support of colleagues (i.e., group-level resource) and support gained from a leader (i.e., leader-level resource) are recognized as important predictors of teachers' occupational well-being in the time of school closures. For example, Spicksley et al. (2021) found that teachers who experienced being supported by other teachers in their school felt more able to cope with the challenges resulted from school closures due to the COVID-19 pandemic. Collie (2021), in turn, examined the role of principal leadership and workplace buoyancy in teachers' occupational well-being during the spring of 2020. She found that autonomy-thwarting leadership was related to teachers' increased experiences of emotional exhaustion, while autonomy-supportive leadership increased workplace buoyancy, which in turn decreased teachers' somatic burden, stress, and emotional exhaustion.

While most of the prior findings have been reached by utilizing a traditional variable-oriented approach, the existing literature also consists of some rare studies in which teachers' occupational well-being during the time of school closures has been examined using a person-oriented approach. For example, Pöysä et al. (2021) have identified profiles of teachers based on their occupational stress and work engagement, and Salmela-Aro et al. (2020) have identified profiles based on teachers' work-related burnout and work engagement, both studies based on the data that had been collected in spring 2020. The findings suggested that there were differences in levels of stress (Pöysä et al., 2021) and levels of burnout (Salmela-Aro et al., 2020) along with differences in levels of work engagement between the profile groups. Thus, even at the time of school closures and at the beginning of the COVID-19 pandemic, teachers were not unanimous with respect to their occupational well-being.

Unfortunately, strains that the COVID-19 pandemic caused to teachers' occupational well-being did not end at the time when full closures of schools ended. As long as the pandemic is present, it continues to affect daily schooling as well. For example, in Finland, teachers have reported that hybrid teaching, that is, a situation where a number of students are participating remotely while others are at school, is not ideal for the sake of teachers or their students (Vuorio et al., 2021). More research is needed to examine teachers' occupational well-being at the time when the pandemic is present, yet schools are open. That kind of knowledge would be particularly helpful when considering the possibility of future pandemics and the well-being of teachers during the pandemics and beyond.

THE PRESENT STUDY

The aim of the present study was to examine teachers' occupational well-being at the time when the COVID-19 pandemic was present, yet teachers and students were mostly at school, but there were some national or local restrictions that teachers had to follow. Based on the previous findings (e.g., Salmela-Aro et al., 2020; Aulén et al., 2021; Pöysä et al., 2021), the person-oriented approach was chosen to acknowledge that teachers' occupational well-being has been individually constructed before and during pandemic. Moreover, to appreciate the view that occupational well-being is drawn from both negative and positive aspects (Van Vegchel et al., 2005; Schaufeli and Taris, 2014), the presence of subgroups was examined based on teachers' experiences of work engagement as well as work-related effort and reward. In addition, to obtain more detailed knowledge, subsequent analyses were conducted. Those examined whether the subgroups would differ with respect to teachers' self-reported occupational well-being (i.e., occupational stress and emotional exhaustion) and self-reported changes in occupational well-being (i.e., occupational stress and emotional exhaustion) as well as change in work-related effort and reward due to the COVID-19 pandemic. Moreover, our subsequent analyses examined possible differences among the subgroups with respect to the teachers' individual resource of work meaningfulness and the leader-level resource of leader–follower relationship. The following research questions and hypotheses were formulated:

RQ1. What kind of profile groups can be identified based on teachers' experiences of work engagement (i.e., vigor, dedication, and absorption) and work-related effort and reward? Based on previous findings suggesting different profiles among teachers before the COVID-19 pandemic (Herman et al., 2018; Aulén et al., 2021) as well as at the beginning of the pandemic (Salmela-Aro et al., 2020; Pöysä et al., 2021), it was expected that several distinct subgroups would be identified in the present sample as well (Hypothesis 1).

RQ2. To what extent do the identified profile groups differ in teachers' self-reported occupational well-being (i.e., occupational stress and emotional exhaustion) and in teachers' self-reported change of occupational well-being (i.e., occupational stress and emotional exhaustion) as well as change in work-related effort and reward due to the COVID-19 pandemic? Based on previous literature indicating that teachers' work engagement and work-related effort and reward are related to teachers' occupational stress and experiences of emotional exhaustion (e.g., Unterbrink et al., 2007; Wang et al., 2015; Skaalvik and Skaalvik, 2016; Pöysä et al., 2021), it was expected that subgroups would differ with respect to teachers' occupational well-being (Hypothesis 2a) as well as with respect to change of occupational well-being due to the COVID-19 pandemic (Hypothesis 2b). In addition, based on previous findings showing that there were certain job-related demands related to the time when the COVID-19 pandemic began (e.g., Kim and Asbury, 2020; MacIntyre et al., 2020), it was expected that subgroups would differ with respect to change in work-related effort and reward due to the COVID-19 pandemic (Hypothesis 2c).

RQ3. To what extent do the identified profile groups differ with respect to the individual resource of work meaningfulness and the leader-level resource of leader–follower relationship? Based on a previous study showing that a sense of meaningful work protects teachers' well-being under stressors (Minkkinen et al., 2020), it was expected that the subgroups would differ based on the self-reported individual resource of work meaningfulness (Hypothesis 3a). In addition, based on previous

findings showing positive relations between work engagement and the leader–follower relationship (Christian et al., 2011) as well as findings indicating the importance of supportive leadership on teachers' occupational well-being (Collie, 2021), it was expected that the profile groups would differ based on the leader-level resource of the leader–follower relationship (Hypothesis 3b).

MATERIALS AND METHODS

Participants and Procedure

The present study was conducted under a larger Teacher and Student Stress and Interaction in Classroom study (TESSI; Lerkkanen and Pakarinen, 2021). The ethical committee of the University of Jyväskylä provided ethical approval for the study, and the research was conducted following the national guidelines for the ethical principles of research with human participants (Finnish National Board on Research Integrity TENK, 2019). The permits to conduct the data collection were also requested and granted from local education authorities before contacting the teachers. The data for the present study were collected from several municipalities located in different areas of Finland in spring 2021. Teachers were approached *via* e-mail by asking whether they would agree to answer a questionnaire concerning their occupational well-being and teaching practices during the COVID-19 pandemic. Before answering the questionnaires, teachers were also asked to read the privacy notices of the study and to mark whether they were participating in the study freely and willingly.

The participants in the present sample were 321 teachers in Grades 1–6. A total of 77.6% of the participants were female and 21.5% male (0.9% chose the option "prefer not to answer"). The vast majority of the participants (98.8%) had a master's degree in education and was qualified to work as teachers in elementary school. Participants' ages ranged from 24 to 68 years ($M = 46.3$ years; $SD = 9.8$ years; $Mdn = 46.5$ years), and work experience ranged from 1 to 41 years ($M = 17.4$ years; $SD = 10.3$ years; $Mdn = 17.0$ years).

Measures

Work Engagement and Work-Related Effort and Reward

The two main measures of the present study were the Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2002; see also Seppälä et al., 2009) and the ERI scale (Siegrist et al., 2004; see also Rantanen et al., 2012). Teachers' work engagement was measured with a nine-item version of the UWES measure. The three measured subscales were as: (1) vigor (3 items; $\alpha = 0.88$; e.g., "At my work, I feel bursting with energy."), (2) dedication (3 items, $\alpha = 0.90$; e.g., "I am enthusiastic about my job."), and (3) absorption (3 items, $\alpha = 0.88$; e.g., "I feel happy when I am working intensely."). The teachers were asked to answer the items on a 7-point Likert scale (1 = *never*; 7 = *daily*). The mean values for each subscale were calculated and used in further analyses. Based on the norm scores drawn across occupations (Schaufeli and Bakker, 2004), vigor is considered high when the average value for the subscale is 5.81–6.65, dedication is considered high when the average value is 5.71–6.69, and absorption is considered high when the average value is 5.21–6.33.

The ERI scale was used to measure teachers' work-related effort and reward. The subscale of effort was measured with six items ($\alpha = 0.78$; e.g., "I have constant time pressure due to a heavy work load.") and the subscale of reward with five items ($\alpha = 0.75$; e.g., "I experience adequate support in difficult situations."). In the subscale of reward, the question concerning salary was excluded from the analyses based on Levene's test. Teachers were asked to answer the items on a 4-point Likert scale (1 = *strongly disagree*; 4 = *strongly agree*), and a higher score represented higher effort and reward. The mean values for both subscales were calculated and used in analyses. The ERI scale has been widely used, and it has been found to be valid in different countries (Van Vegchel et al., 2005), including Finland (e.g., Kinnunen et al., 2008; Feldt et al., 2016).

Other Measures

Teachers' Occupational Stress

The extent of teachers' occupational stress was measured with the following question: "Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time. Do you feel this kind of stress these days?" (Elo et al., 2003). Teachers were asked to answer the item on a 6-point Likert scale (1 = *not at all*; 6 = *very much*). The previous literature has verified that this single-item measure is valid for identifying occupational stress (Elo et al., 2003; see also Eddy et al., 2019).

Emotional Exhaustion

The extent of teachers' emotional exhaustion was measured using a shortened Finnish version of the Bergen Burnout Inventory (BBI; Salmela-Aro et al., 2011). The three items constituting the subscale of emotional exhaustion were used ($\alpha = 0.77$; e.g., "I am snowed under with work"). Teachers were asked to answer on a 6-point Likert scale (1 = *completely disagree*; 6 = *completely agree*). The mean value for the subscale was calculated and used in analyses.

Changes in Occupational Well-Being Due to the COVID-19 Pandemic

To examine possible changes in teachers' occupational well-being due to the COVID-19 pandemic, the present study used two measures created for this purpose. One of those measures, a single-item question measuring teachers' occupational stress due to the COVID-19 pandemic, has been used previously (Pöysä et al., 2021). The single-item question rated on a 4-point Likert scale (1 = *not at all*; 4 = *entirely*) was "To what extent has the increase in your occupational stress been due to the COVID-19 situation?" The other measure including three items focused on change in emotional exhaustion. The measure was adapted by asking teachers to consider along of original measure for emotional exhaustion (i.e., the original subscale of emotional exhaustion of the Finnish version of the BBI; Salmela-Aro

et al., 2011) whether their experiences had remained relatively the same or whether there was an increase or decrease with the experience that specific item focused on. The internal consistency for the adapted subscale was acceptable ($\alpha = 0.74$), and the mean value for the subscale was calculated and used in analyses.

Changes in Work-Related Effort and Reward Due to the COVID-19 Pandemic

Teachers' experiences of change with respect to work-related effort and reward due to the COVID-19 pandemic were measured with an adapted measure of the work-related effort and reward ERI scale (i.e., Siegrist et al., 2004). Teachers were asked to consider whether their experiences had remained relatively the same or whether there was an increase or decrease with the experience that specific item focused on. The internal consistencies for the adapted subscales were acceptable (six items for change in effort, $\alpha = 0.81$; five items for change in reward, $\alpha = 0.69$), and the mean values for both subscales were calculated and used in analyses.

Work Meaningfulness

The individual resource of the work's meaningfulness was measured with the Work as Meaning Inventory (WAMI; Steger et al., 2012). The four items that constitute the subscale of positive meaning were used ($\alpha = 0.93$; e.g., "I have a good sense of what makes my job meaningful."). Teachers were asked to answer on a 5-point Likert scale (1 = *completely disagree*; 5 = *completely agree*). The mean value for the subscale was calculated and used in analyses.

Leader–Follower Relationship

The leader-level resource of the leader–follower relationship was measured with the Finnish version of the Leader–Member Exchange measure (LMX; Graen and Uhl-Bien, 1995; see also Norvapalo, 2014). Teachers were asked to answer seven items ($\alpha = 0.93$; e.g., "My leader understands my work problems and needs.") on a 5-point Likert scale (1 = *disagree*; 5 = *agree*). The mean value for the items was calculated and used in analyses.

Statistical Analyses

A person-oriented approach with a latent profile analysis (LPA; Vermunt and Magidson, 2002; Lubke and Muthén, 2005) was utilized in the present study. LPA is a model-based variant of traditional cluster analysis that aims to identify the smallest number of latent classes that adequately describe the associations between observed continuous variables (Vermunt and Magidson, 2002; Nylund-Gibson and Masyn, 2016). The advantage of LPA is that it recognizes that populations are not necessarily heterogeneous in how the measured variables are related to possible outcomes (Bergman and Trost, 2006; Laursen and Hoff, 2006).

When conducting the enumeration process, a series of LPAs are performed to examine profile solutions that differ with respect to the number of profiles. The best-fitting solution is recognized based on the fit indices as well as theoretical and practical considerations. The fit indices used in the present study were log-likelihood (log L), Akaike information criterion (AIC), Bayesian information criterion (BIC), and adjusted Bayesian information criterion (ABIC) as well as the Vuong–Lo–Mendell–Rubin (VLMR) likelihood ratio test and the adjusted Lo–Mendell–Rubin (LMR) test. The LPA with the lowest log L, AIC, BIC, and ABIC values is considered to provide a good fit to the data, and $p > 0.05$ with VLMR and LMR indicates that the model with one less class should be rejected in favor of the estimated model (e.g., Lo et al., 2001; Nylund et al., 2007).

In the present study, LPAs were conducted using teachers' self-ratings on their vigor, dedication, and absorption (i.e., three subscales of work engagement) as well as self-ratings of their work-related effort and reward. The LPAs were conducted using the Mplus statistical package (version 7.4; Muthén and Muthén, 1998). The subsequent analyses comparing the profile groups with the multinomial regression analyses and pairwise comparisons with respect to teachers' occupational stress, emotional exhaustion, work meaningfulness, leader–follower relationship, and changes in occupational well-being during the COVID-19 pandemic were conducted for a best-fitting profile solution by utilizing the auxiliary function and the three-step procedure along with the LPA. To validate the chosen profile solution, one-way ANOVA and pairwise comparison were conducted using the IBM SPSS Statistics Version 26 in terms of the criterion variables.

RESULTS

Descriptive Statistics

Descriptive statistics of the criterion variables on which the latent profile analysis was based (i.e., vigor, dedication, and absorption as well as the work-related effort and reward) are presented in **Table 1**. Based on descriptive statistics concerning teachers' work engagement, the participating teachers experienced, on average, high levels of dedication and absorption, and average levels of vigor when compared with the norm scores across occupations (Schaufeli and Bakker, 2004). Descriptive statistics concerning teachers' work-related effort and reward suggested that teachers experienced, on average, their work-related demands and rewards at somewhat similar levels. Furthermore, correlations calculated for the criterion variables (**Table 1**) suggested strong and somewhat strong positive correlations among the three subscales of work engagement (i.e., vigor, dedication, and absorption). In addition, a somewhat moderate negative correlation was found between work-related effort and reward. Correlations among the three subscales of work engagement and effort were negative, yet only weak at most. Instead, correlations among the three subscales of work engagement and reward were positive, but only weak or somewhat moderate.

The Identified Profile Groups

LPAs were conducted to examine what kind of profile groups, based on teachers' experiences of work engagement (i.e., vigor, dedication, and absorption) and work-related effort and reward,

TABLE 1 | Descriptive statistics and correlation matrix for the criterion variables upon which the latent profile analysis was based.

	M (*SD*)	min	max	1	2	3	4	5
1. Vigor	5.68 (1.16)	1	7		0.89**	0.70**	−0.37**	0.41**
2. Dedication	5.87 (1.17)	1	7			0.73**	−0.30**	0.39**
3. Absorption	5.62 (1.27)	1	7				−0.13*	0.29**
4. Effort	2.92 (0.55)	1	4					−0.42**
5. Reward	2.96 (0.58)	1	4					

*Work engagement constituting vigor, dedication, and absorption: 1 (never) to 7 (daily); Work-related effort and reward: 1 (strongly disagree) to 4 (strongly agree). *p > 0.05; **p > 0.01.*

TABLE 2 | Fit indices for the series of latent profile analyses (LPAs).

Number of classes	Log L	AIC	BIC	ABIC	*p*VLMR	*p*LMR	*n*	Entropy
1	−2083.89	4187.78	4225.50	4193.78			321	
2	−1831.79	3695.57	3755.91	3705.16	0.016	0.017	86/235	0.895
3	**−1679.94**	**3403.88**	**3486.85**	**3417.07**	**0.002**	**0.002**	**15/103/203**	**0.931**
4	−1623.66	3303.32	3408.92	3320.11	0.629	0.634	15/55/93/158	0.864
5	−1576.23	3220.45	3348.68	3240.84	0.050	0.052	54/10/107/26/124	0.890
6	−1554.94	3189.89	3340.74	3213.87	0.350	0.357	10/52/23/8/126/102	0.888

Log L, Log-likelihood; AIC, Akaike information criterion; BIC, Bayesian information criterion; ABIC, adjusted Bayesian information criterion; VLMR, Vuong–Lo–Mendell–Rubin likelihood ratio test; and LMR, adjusted Lo–Mendell–Rubin test.

could be identified. During the enumeration process, the results of LPAs demonstrated that the fit indices of log L, BIC, ABIC, and AIC decreased when the number of profiles increased without providing a point of elbowing (**Table 2**). The *p*-values (>0.05) for both the VLMR and LMR tests suggested that up to a three-profile solution, the model with one less profile could be rejected in favor of the estimated model. The three-profile solution, which provided the lowest *p*-values in the VLMR and LMR tests, was determined to provide the most optimal fit with the data, as it was also theoretically and practically reasonable.

In the three-profile solution (**Figure 1**; **Table 3**), the first profile group comprised 4.7% ($n = 15$) of the participating teachers. Teachers in this profile group were found to have the lowest levels of vigor, dedication, and absorption, while they also had the highest level of effort and lowest level of reward. Thus, profile group 1 was named *Poorly Engaged with Highest Effort and Lowest Reward*. The second profile group comprised 32.1% of participating teachers ($n = 103$). Profile group 2 was composed of teachers whose vigor, dedication, and absorption were at average levels, and their experience of effort was higher than their experience of reward. Thus, profile group 2 was named *Averagely Engaged with Higher Effort than Reward*. The third profile group applied to 63.2% ($n = 203$) of the participating teachers. Teachers in this profile group were found to have high levels of vigor, dedication, and absorption, and their experience of reward was higher than their experience of effort. Thus, profile group 3 was named *Highly Engaged with Higher Reward than Effort*.

The three-profile solution was validated with one-way ANOVAs and pairwise comparisons in terms of the criterion variables on which the LPA was based. The results of the ANOVAs suggested that all profiles differed from each other (**Table 3**). The results of pairwise comparisons complemented this by suggesting that each profile had its own unique features when compared with other profile groups.

Differences in Teachers' Well-Being Among the Profile Groups

Multinomial regression analyses and pairwise comparisons were conducted to examine the extent to which the identified profile groups differed in teachers' self-reported occupational well-being (i.e., occupational stress and emotional exhaustion). The findings showed that the three identified profile groups differed to some extent with respect to occupational stress. Teachers in profile group 1 (i.e., *Poorly Engaged with Highest Effort and Lowest Reward*) reported significantly higher levels of occupational stress than teachers in profile group 2 (i.e., *Averagely Engaged with Higher Effort than Reward*; $\beta = 0.68$, $p = 0.023$) or in profile group 3 (i.e., *Highly Engaged with Higher Reward than Effort*; $\beta = 1.02$, $p = 0.002$). Profile groups 2 and 3 did not differ significantly from one another. In addition, with respect to teachers' experiences of emotional exhaustion, the profile groups did not differ from one another.

To examine whether the profile groups would differ with respect to self-reported changes in teachers' occupational well-being due to the COVID-19 pandemic, multinomial regression analyses and pairwise comparisons were also conducted for the measures that were adapted for this purpose. First, the results concerning the single-item question focusing on the extent to which the increase in their occupational stress was related to the COVID-19 situation suggested that teachers in profile group 3 (i.e., *Highly Engaged with Higher Reward than Effort*) experienced that the COVID-19 pandemic had less to do with their possible increase of occupational stress than

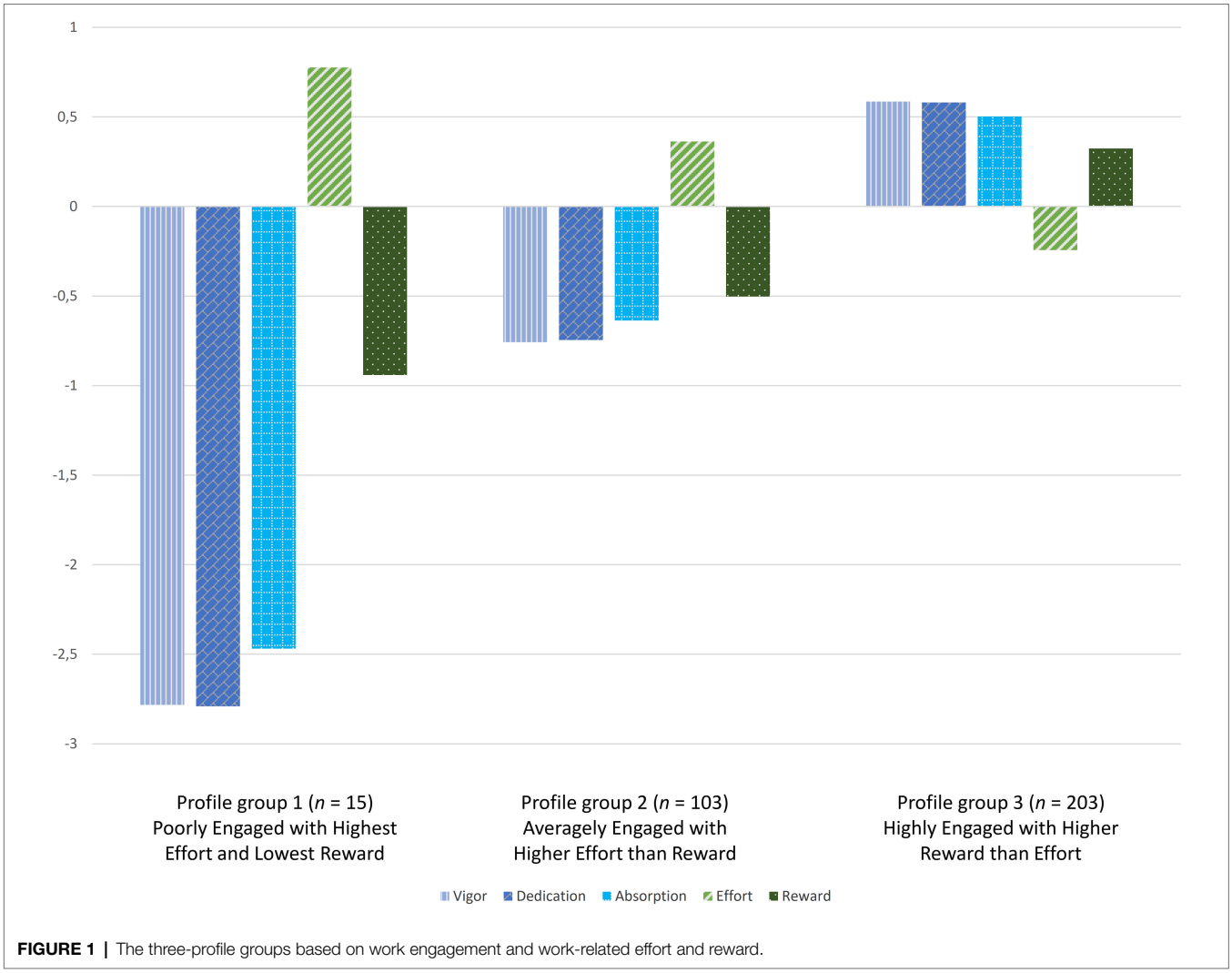


FIGURE 1 | The three-profile groups based on work engagement and work-related effort and reward.

teachers in profile group 1 (i.e., *Poorly Engaged with Highest Effort and Lowest Reward*; $\beta = -1.36$, $p = 0.006$) or in profile group 2 (i.e., *Averagely Engaged with Higher Effort than Reward*; $\beta = -0.58$, $p = 0.026$). Profile groups 1 and 2 did not differ significantly from one another.

Second, the results concerning the change in teachers' emotional exhaustion suggested that teachers in profile group 3 (i.e., *Highly Engaged with Higher Reward than Effort*) reported that the COVID-19 pandemic resulted in less increase in their emotional exhaustion than teachers in profile group 1 (i.e., *Poorly Engaged with Highest Effort and Lowest Reward;* $\beta = -2.05$, $p = 0.042$) or in profile group 2 (i.e., *Averagely Engaged with Higher Effort than Reward*; $\beta = -1.48$, $p = 0.005$). Profile groups 1 and 2 did not differ significantly from one another.

The results concerning work-related effort suggested that teachers in profile group 3 (i.e., *Highly Engaged with Higher Reward than Effort*) reported that the COVID-19 pandemic had resulted in a higher increase in their effort than teachers in profile group 2 (i.e., *Averagely Engaged with Higher Effort than Reward*; $\beta = 1.42$, $p = 0.036$). No other significant differences with respect to changes in effort were found among the profile groups. In addition, the results suggested that the profile groups did not differ with respect to changes in work-related rewards due to the COVID-19 pandemic.

Differences in the Individual and Leader-Level Resources Among the Profile Groups

With respect to self-reported work meaningfulness, the results of multinomial regression analyses and pairwise comparisons showed that each profile group differed from the others. Teachers in profile group 1 (i.e., *Poorly Engaged with Highest Effort and Lowest Reward*) reported significantly lower levels in their work meaningfulness than teachers in profile group 2 (i.e., *Averagely Engaged with Higher Effort than Reward*; $\beta = -1.32$, $p = 0.003$) or in profile group 3 (i.e., *Highly Engaged with Higher Reward than Effort*; $\beta = -4.16$, $p < 0.001$). In addition, teachers in profile group 2 (i.e., *Averagely Engaged with Higher Effort than Reward*) reported a significantly lower level in their work meaningfulness than teachers in profile group 3 (i.e., *Highly Engaged with Higher Reward than Effort*; $\beta = -2.84$, $p < 0.001$).

TABLE 3 | Differences in work engagement and work-related effort and reward among profile groups.

	Profile group 1 Poorly Engaged with Highest Effort and Lowest Reward (*n* = 15)	Profile group 2 Averagely Engaged with Higher Effort than Reward (*n* = 103)	Profile group 3 Highly Engaged with Higher Reward than Effort (*n* = 203)	ANOVA	Pairwise comparison
	M (*SD*)	*M* (*SD*)	*M* (*SD*)	*F*(2, 317)	
Vigor	2.44 (0.73)	4.80 (0.68)	6.36 (0.48)	517.84***	[2]1 < 2, 3; 2 < 3
Dedication	2.60 (0.77)	5.00 (0.74)	6.55 (0.46)	496.77***	[2]1 < 2, 3; 2 < 3
Absorption	2.49 (1.27)	4.81 (1.07)	6.26 (0.63)	215.88***	[2]1 < 2, 3; 2 < 3
Effort	3.34 (0.36)	3.11 (0.49)	2.78 (0.56)	19.26***	[1]1, 2 > 3
Reward	2.41 (0.54)	2.67 (0.47)	3.15 (0.55)	37.15***	[1]1, 2 < 3

*Work engagement constituting vigor, dedication, and absorption: 1 (never) to 7 (daily); Work-related effort and reward: 1 (strongly disagree) to 4 (strongly agree); Pairwise comparisons reported among groups in which differences were statistically significant at p < 0.001 with ANOVA post-hoc. [1]LSD. [2]Dunnett T3 correction. ***p > 0.001.*

Multinomial regression analyses and pairwise comparisons were also conducted to examine whether the profile groups would differ with respect to teachers' self-reported experiences of their leader–follower relationship. The findings showed a significant difference between two profile groups. Teachers in profile group 3 (i.e., *Highly Engaged with Higher Reward than Effort*) reported a significantly higher quality of the leader–follower relationship than teachers in profile group 2 (i.e., *Averagely Engaged with Higher Effort than Reward*; $\beta = 0.80$, $p = 0.001$).

DISCUSSION

The present study contributes to the existing literature by supporting the view that teachers' occupational well-being is individually constructed, and by identifying subgroups of teachers with different profiles related to occupational well-being during the time when the COVID-19 pandemic was present but there were no national school closures. The findings of this study contribute to the literature by suggesting that the identified profile groups differ to some extent, for example, with respect to teachers' occupational stress as well as with respect to teachers' individual resource of work meaningfulness and the leader-level resource of the leader–follower relationship. The knowledge gained in this study is valuable for teachers, researchers as well as policy makers for preparing the possible future crises. It is important to find ways to deal with the strains that possible pandemics and other unexpected changes could have on teachers' occupational well-being.

First, as expected (Hypothesis 1), distinct subgroups were identified based on teachers' experiences of work engagement (i.e., vigor, dedication, and absorption) and work-related effort and reward. Within the present three-profile solution, the smallest profile group was the one where teachers were recognized as being relatively *Poorly Engaged with Highest Effort and Lowest Reward* (Profile group 1; 4.7% of participants). Approximately one-third of the participating teachers were recognized as being *Averagely Engaged with Higher Effort than Reward* (Profile group 2; 32.1% of participants), and well above half of the participating teachers were recognized as being *Highly Engaged with Higher Reward than Effort* (Profile group 3; 63.2% of participants). The size of the smallest profile group (Profile group 1) was somewhat smaller than could have been expected based on previous studies. However, the existing studies from the beginning of the pandemic have identified profile groups, for example, based on work engagement and occupational stress (Pöysä et al., 2021) or based on work engagement and emotional exhaustion (Salmela-Aro et al., 2020), and there are no prior studies in which the profile solutions would have been examined with the same set of criterion variables that were used in the current study. In addition, it should be noted that profile group 1 (i.e., *Poorly Engaged with Highest Effort and Lowest Reward*) and profile group 2 (i.e., *Averagely Engaged with Higher Effort than Reward*) did not differ significantly with respect to work-related effort and reward. Thus, the smallest profile group consisted specifically of those teachers who were particularly poorly engaged.

According to previous literature, an experience of work engagement is built on the presence of job-related resources (e.g., Schaufeli and Taris, 2014; Lesener et al., 2020). In the present study, the criterion variables used for the latent profile analyses included teachers' self-ratings of their work-related rewards. The items used tapped into teachers' own experiences of receiving adequate support and appreciation along with having pleasant prospects for the future (Siegrist et al., 2004), and such items can also be seen as being related to job-related resources (see Nielsen et al., 2017; Lesener et al., 2020). The present findings concerning the largest profile group (i.e., profile group 3; *Highly Engaged with Higher Reward than Effort*) can be seen to be in congruence with the view that teachers' work engagement and experience of job-related resources are related as: teachers who had the highest levels of work-related reward were also those with the highest levels of work engagement. However, as the other two profile groups differed significantly with respect to work engagement, yet not with respect to work-related reward, it can be assumed that, at least among some teachers, a level of work-related resources is not necessarily related to the level of work engagement. While the data used in the present study do not allow one to examine this further,

it seems that, to some extent, an experience of work engagement can be built on the basis of job-related resources, but at the same time, it seems that at least lower levels of job-related resources do not determine the level of work engagement. Nevertheless, such findings can be seen as verifying previous findings (e.g., Salmela-Aro et al., 2020; Pöysä et al., 2021), indicating that there are differences in the ways in which teachers' occupational well-being is construed. Therefore, the present findings further highlight that it is important to utilize analytical approaches that move beyond traditional variable-oriented approaches.

Second, Hypothesis 2a concerning the differences in teachers' self-reported occupational well-being (i.e., occupational stress and emotional exhaustion) among the profile groups was only partially confirmed. As Hypothesis 2a predicted, the findings with respect to occupational stress suggest that teachers recognized as being *Poorly Engaged with Highest Effort and Lowest Reward* (i.e., Profile group 1) experienced occupational stress more than teachers in the other two profile groups did. However, teachers within the two other profile groups (i.e., profile groups 2 and 3) did not differ significantly. Thus, in the present sample, the prevalence of occupational stress seemed to be higher, especially among those teachers who were poorly engaged. While the lack of difference between profile groups 2 and 3 was somewhat surprising, the findings with respect to profile group 1 indicate that the experience of work engagement may provide protection against the elements, such as stress, that are damaging to occupational well-being. Such suggestions have been made in previous literature as well (e.g., Bermejo-Toro et al., 2016). Moreover, based on the present findings, it seems that in a sense of protecting oneself from stress, average level of work engagement is perhaps enough.

With respect to teachers' experiences of emotional exhaustion, in contrast to what was expected (Hypothesis 2a), there were no statistically significant differences between the profile groups. This was astonishing, as a number of previous studies have found that teachers' emotional exhaustion and burnout are negatively related to work engagement (e.g., Hakanen et al., 2006; Skaalvik and Skaalvik, 2016), and there is also previous evidence showing that teachers' experience of high levels of effort is related to high levels of emotional exhaustion (Wang et al., 2015). Based those findings, it was reasonable to expect that profile groups identified on a basis of work engagement, along with work-related effort and reward would have differed with respect to teachers' experiences of emotional exhaustion as well. However, regarding to profile groups 2 and 3, the lack of difference in teachers' emotional exhaustion can perhaps be explained with the lack of difference in teacher-reported occupational stress. This is because the previous literature has shown that an experience of emotional exhaustion builds on the experience of prolonged stress (e.g., Maslach et al., 2001; Schaufeli and Salanova, 2013). Therefore, as there was no statistically significant difference between the profile groups 2 and 3 with respect to occupational stress, it is understandable that there is no significant difference in teachers' experience of emotional exhaustion either. Perhaps this explanation is somewhat applicable to the non-significant ($p = 0.73$) difference in teachers' emotional exhaustion between the profile groups 1 and 3 as well.

Third, as expected (Hypothesis 2b), there were some differences among the profile groups with respect to self-reported changes in occupational well-being due to the COVID-19 pandemic. Based on the findings concerning both of the measured indicators (i.e., the extent to which the increase in teachers' occupational stress was related to the COVID-19 pandemic and a change in emotional exhaustion), the occupational well-being of teachers in profile group 3 (i.e., *Highly Engaged with Higher Reward than Effort*) seemed to be less influenced by the COVID-19 pandemic than it was in the other two profile groups. However, profile groups 1 and 2 did not differ with respect to change in occupational stress nor with respect to change in emotional exhaustion. Nevertheless, these findings are also in line with previous studies suggesting that an experience of work engagement and different job-related resources may protect against the negative impacts of job-related demands and the other elements that negatively affect well-being (e.g., Bakker et al., 2007). While the present study cannot be used to determine the critical point where this possible protection process may begin, it is important to notice how the strains that teachers are facing with the COVID-19 pandemic and will surely have to face in future pandemics, can be supported by strengthening teachers' work engagement as well as by increasing the balance between experiences of work-related effort and reward.

Fourth, in contrast to what was expected (Hypothesis 2c), the profile groups did not clearly differ with respect to changes in work-related effort and reward due to the COVID-19 pandemic. Understandably, profile group 1 (i.e., *Poorly Engaged with Highest Effort and Lowest Reward*) and profile group 2 (i.e., *Averagely Engaged with Higher Effort than Reward*) did not differ with respect to changes of work-related effort and reward due to the COVID-19 pandemic, as those profile groups also did not differ with respect to work-related effort and reward when used as criterion variables for the profile analysis. The only statistically significant difference showed that teachers recognized as being *Highly Engaged with Higher Reward than Effort* (i.e., profile group 3) reported a higher increase in their work-related effort than teachers recognized as being *Averagely Engaged with Higher Effort than Reward* (i.e., profile group 2). In other words, teachers with lower levels of work-related effort than reward were the ones who felt that their work-related effort had actually increased more due to the COVID-19 pandemic than teachers with higher levels of work-related effort than reward. Unfortunately, the cross-sectional data used for the present study do not allow one to examine the change in more detail. However, the findings related to Hypothesis 2c can be seen to indicate two things. First, it should be noted that in the present sample, teachers' experiences of change in their work-related reward due to the COVID-19 pandemic did not differ between profile groups. That seems quite a reassuring finding, as it means that despite evident changes and job-related demands as a result of the COVID-19 pandemic (e.g., Kim and Asbury, 2020; MacIntyre et al., 2020), teachers in different profile groups did not differ in terms of how they felt about changes in receiving adequate support and appreciation

from their peers and leaders. Second, similar to what was discussed above, these findings highlight that an experience of work engagement and different job-related resources may provide protection against the negative impacts of job-related demands and the elements that are harming the well-being (e.g., Bakker et al., 2007; Bermejo-Toro et al., 2016). Teachers in profile group 3 (i.e., *Highly Engaged with Higher Reward than Effort*) experienced an increase in their effort due to the COVID-19 pandemic, yet they still had the lowest levels of effort when it was used as a criterion variable for the profile groups. Thus, the occupational well-being of these teachers was not perhaps severely affected by this increase of effort; instead, they were able to cope well with the situation.

The third research question focused on the extent to which the identified profile groups differed with respect to the self-reported individual resource of work meaningfulness and the leader-level resource of the leader–follower relationship. The findings suggest, as proposed in Hypothesis 3a, that each profile group differed based on the self-reported individual resource of work meaningfulness. Teachers recognized as being *Highly Engaged with Higher Reward than Effort* (i.e., profile group 3) reported the highest work meaningfulness, while teachers recognized as being *Poorly Engaged with Highest Effort and Lowest Reward* (i.e., profile group 1) reported the lowest. These findings are important for at least the following reasons. First, as prior research has indicated that teachers' experience of work meaningfulness is positively related with their work engagement (e.g., Ugwu and Onyishi, 2018) and that individual resources such as a sense of work's meaningfulness helps a worker to cope with the demands of the job (e.g., Minkkinen et al., 2020), the findings showing that each profile group differed with respect to work meaningfulness can be seen to validate the current three-profile solution. Second, the findings highlight the importance of individual resources of work meaningfulness. Particularly when considered along with the findings gained with respect to Hypothesis 2c, these findings can also be seen to concur with a prior finding suggesting that a sense of meaningful work protects teachers' well-being under stressors (Minkkinen et al., 2020). Perhaps these findings can be interpreted to imply that a sense of work meaningfulness should be seen as a critical factor during this time of recovery from the COVID-19 pandemic and beyond. Moreover, it should be remembered that teachers need to experience their job as meaningful, and perhaps particularly so when they are working under exceptional circumstances for some reason. Therefore, it would be important to examine more, for example, the ways in which the COVID-19 pandemic and the different restrictions that resulted from it have influenced teachers' social relations with other teachers, parents, and students, and whether any changes that occurred have impacted teachers' sense of work meaningfulness.

Finally, somewhat in line with what was expected (Hypothesis 3b), there were some differences with respect to the leader-level resource of the leader–follower relationship among the profile groups. Teachers recognized as being *Highly Engaged with Higher Reward than Effort* (i.e., Profile group 3) reported a higher quality of leader–follower relationship than teachers recognized as being *Averagely Engaged with Higher Effort than Reward* (i.e., profile group 2). While no other differences were found, the findings concur with the previous ones (e.g., Collie, 2021) by indicating that for some teachers, the quality of the leader–follower relationship can be seen as related to their occupational well-being. Perhaps it could even be possible to speculate whether by enhancing the leader-level resource of the quality of leader–follower relationship, teachers recognized as being *Averagely Engaged with Higher Effort than Reward* (i.e., profile group 2) could establish one beneficial buffer against the work-related demands, which could enhance their occupational well-being further (see Christian et al., 2011; Nielsen et al., 2017; Lesener et al., 2020). Yet, the present findings with respect to the absence of differences in the leader–follower relationship among the profile groups can raise the question of whether teachers recognized as being *Poorly Engaged with Highest Effort and Lowest Reward* (i.e., profile group 1) can efficiently benefit the quality of the leader–follower relationship as a job-related resource. The fact that there was no difference in the leader–follower relationship between profile groups 1 and 3 suggests that teachers recognized as being *Highly Engaged with Higher Reward than Effort* (i.e., profile group 3) were perhaps more capable of utilizing the support gained from leaders than teachers recognized as being *Poorly Engaged with Highest Effort and Lowest Reward* (i.e., profile group 1). Thus, more research is needed to find ways to enhance the occupational well-being of all teachers, for example, by focusing on ways the leader can provide such feedback that enhances teachers' work engagement during exceptional times and in other ways as to how teachers can be supported *via* social capital integrated in schools.

LIMITATIONS AND SUGGESTIONS FOR FUTURE STUDIES

This study has some limitations. First, the measures used to capture the possible change in teachers' emotional exhaustion as well as in work-related effort and reward due the COVID-19 pandemic were used for the first time in the current study. While the measures were adapted by adding simple questions along with the original measures (i.e., the original subscale of emotional exhaustion of the Finnish version of the BBI, Salmela-Aro et al., 2011, and the original subscales of effort and reward of the ERI scale, Siegrist et al., 2004), and the internal consistencies for the adapted measures were acceptable, it would be important to use the same measures in future studies to gain more experience on applicability of these measures. Second, the data used for the present study were cross-sectional, and, thus, based on the data used, no causal inferences can be made. In addition, results with respect to changes in teachers' experiences due to the COVID-19 pandemic were obtained by asking teachers to consider whether their experiences had remained relatively the same or whether there was an increase or a decrease when compared with the time before the COVID-19 pandemic. It is possible that such questions are not easy to evaluate. These kinds of limitations could be faced if there would be a possibility to collect longitudinal

data that could capture possible changes in teachers' experiences of their occupational well-being repeatedly and simultaneously while the COVID-19 pandemic evolves. Such data could also allow examination of causal directions. Finally, it is evident that the number of teachers in profile group 1 was rather small ($n = 15$). While there was no reason to doubt the reliability of the present results due to analytical approaches that were chosen, one should consider the size of the group when generalizing the findings as the group covers only limited number of teachers. While the percentage of teachers with the poorest occupational well-being is mercifully quite low in general, it also means that the total number of participants should be relatively large in order to reach bigger number of participants recognized as having the poorest well-being.

The findings gained in the present study provide some suggestions for future studies. First, as the present findings align with the prior ones (e.g., Herman et al., 2021; Pöysä et al., 2021) by showing that teachers' occupational well-being is individually constructed, they suggest that in order to enhance the theory development and provision of practical suggestions, future studies should be conducted using analytical approaches that move beyond traditional variable-oriented approaches. Such studies are needed, for example, to examine further the differences in the ways in which teachers' work engagement is built on the basis of job-related and personal resources. Using a person-oriented approach with a larger dataset would provide insightful and valuable knowledge on what kind of support would be beneficial for teachers with different well-being profiles. This kind of understanding would be central during the time of the COVID-19 pandemic as well as in order to prepare for possible future crises. In addition, while the present findings complimented the literature and provided a relatively practical perception that there are differences in the ways in which certain job-related resources, for instance, a leader-level resource of leader–follower relationship, may be related to teachers' occupational well-being, more research is needed to gain a deeper understanding of this phenomenon. It would be important to find the ways in which each teacher could benefit from resources integrated into the social capital of the teachers' work environment.

DATA AVAILABILITY STATEMENT

The datasets presented in this article are not readily available because of the ongoing research. Requests to access the datasets should be directed to sanni.poysa@jyu.fi.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the ethical committee of the University of Jyväskylä. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

SP was responsible for the research questions and statistical analyses of the present manuscript, and she functioned as a corresponding author. EP was the Responsible Researcher and M-KL was the Principal Investigator of the larger Teacher and Student Stress and Interaction in Classroom study (TESSI; Lerkkanen and Pakarinen, 2021), under which the current study was conducted. They were responsible for the design, data collection, and publication plan of the TESSI study, and together they supported SP in analyzing the data and coauthoring the current manuscript. All authors contributed to the article and approved the submitted version.

FUNDING

This study is a part of the project EduRESCUE–the resilient schools and the education system. This study was funded by the Strategic Research Council (SRC) established within the Academy of Finland (345196), by grants from the Academy of Finland (nos. 335635 and 317610), and by the grant from The Trade Union of Education in Finland.

REFERENCES

Aulén, A.-M., Pakarinen, E., Feldt, T., and Lerkkanen, M.-K. (2021). Teacher coping profiles in relation to teacher well-being: A mixed method approach. *Teach. Teach. Educ.* 102:103323. doi: 10.1016/j.tate.2021.103323

Bakker, A. B., Hakanen, J. J., Demerouti, E., and Xanthopoulou, D. (2007). Job resources boost work engagement, particularly when job demands are high. *J. Educ. Psychol.* 99, 274–284. doi: 10.1037/0022-0663.99.2.274

Bellingrath, S., Rohleder, N., and Kudielka, B. M. (2010). Healthy working school teachers with high effort-reward-imbalance and Over commitment show increased pro-inflammatory immune activity and a dampened innate immune Defence. *Brain Behav. Immun.* 24, 1332–1339. doi: 10.1016/j.bbi.2010.06.011

Bergman, L. R., and Trost, K. (2006). The person-oriented versus the variable-oriented approach: are they complementary, opposites, or exploring different worlds? *Merrill-Palmer Q.* 52, 601–632. doi: 10.1353/mpq.2006.0023

Bermejo-Toro, L., Prieto-Ursúa, M., and Hernández, V. (2016). Towards a model of teacher well-being: personal and job resources involved in teacher burnout and engagement. *Educ. Psychol.* 36, 481–501. doi: 10.1080/01443410.2015.1005006

Chan, M.-K., Sharkey, J. D., Lawrie, S. I., Arch, D. A. N., and Nylund-Gibson, K. (2021). Elementary school teacher well-being and supportive measures amid COVID-19: An exploratory study. *School Psychol.* 36, 533–545. doi: 10.1037/spq0000441

Christian, M. S., Garza, A. S., and Slaughter, J. E. (2011). Work engagement: A quantitative review and test of its relations with task and contextual performance. *Pers. Psychol.* 64, 89–136. doi: 10.1111/j.1744-6570.2010.01203.x

Collie, R. J. (2021). COVID-19 and teachers' somatic burden, stress, and emotional exhaustion: examining the role of principal leadership and workplace buoyancy. *AERA Open.* 7:233285842098618. doi: 10.3886/E127641V1

Collie, R. J., and Martin, A. J. (2017). Teachers' sense of adaptability: examining links with perceived autonomy support, teachers' psychological functioning, and students' numeracy achievement. *Learn. Individ. Differ.* 55, 29–39. doi: 10.1016/j.lindif.2017.03.003

Cumming, T. (2017). Early childhood educators' well-being: An updated review of the literature. *Early Child. Educ. J.* 45, 583–593. doi: 10.1007/s10643-016-0818-6

Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The job demands-resources model of burnout. *J. Appl. Psychol.* 86, 499–512. doi: 10.1037/0021-9010.86.3.499

Eddy, C. L., Herman, K. C., and Reinke, W. M. (2019). Single-item teacher stress and coping measures: concurrent and predictive validity and sensitivity to change. *J. Sch. Psychol.* 76, 17–32. doi: 10.1016/j.jsp.2019.05.001

Elo, A.-L., Leppänen, A., and Jahkola, A. (2003). Validity of a single-item measure of stress symptoms. *Scand. J. Work Environ. Health* 29, 444–451. doi: 10.5271/sjweh.752

Feldt, T., Hyvönen, K., Mäkikangas, A., Rantanen, J., Huhtala, M., and Kinnunen, U. (2016). Over commitment as a predictor of effort–reward imbalance: evidence from an 8-year follow-up study. *Scand. J. Work Environ. Health* 42, 309–319. doi: 10.5271/sjweh.3575

Finnish National Board on Research Integrity TENK (2019). The ethical principles of research with human participants and ethical review in the human sciences in Finland. Finnish National Board on Research Integrity TENK guidelines 2019. Available at: https://tenk.fi/sites/default/files/2021-01/Ethical_review_in_human_sciences_2020.pdf (Accessed October 15, 2021).

Foley, C., and Murphy, M. (2015). Burnout in Irish teachers: investigating the role of individual differences, work environment and coping factors. *Teach. Teach. Educ.* 50, 46–55. doi: 10.1016/j.tate.2015.05.001

Geldenhuys, M., Łaba, K., and Venter, C. M. (2014). Meaningful work, work engagement and Organizational commitment. *SA J. Ind. Psychol.* 40, 1–10. doi: 10.4102/SAJIP.V40I1.1098

Graen, G. B., and Uhl-Bien, M. (1995). Relationship-based approach to leadership: development of leader-member exchange (LMX) theory of leadership over 25 years: applying a multi-level multi-domain perspective. *Leadership Q.* 6, 219–247. doi: 10.1016/1048-9843(95)90036-5

Hakanen, J. J., Bakker, A. B., and Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *J. Sch. Psychol.* 43, 495–513. doi: 10.1016/j.jsp.2005.11.001

Herman, K. C., Hickmon-Rosa, J., and Reinke, W. M. (2018). Empirically derived profiles of teacher stress, burnout, self-efficacy, and coping and associated student outcomes. *J. Positive Behav. Int.* 20, 90–100. doi: 10.1177/1098300717732066

Herman, K. C., Sebastian, J., Reinke, W. M., and Huang, F. L. (2021). Individual and school predictors of teacher stress, coping, and wellness during the COVID-19 pandemic. *School Psychol.* 36, 483–493. doi: 10.1037/spq0000456

Hinz, A., Zenger, M., Brähler, E., Spitzer, S., Scheuch, K., and Seibt, R. (2014). Effort–reward imbalance and mental health problems in 1074 German teachers, compared with those in the general population. *Stress. Health* 32, 224–230. doi: 10.1002/smi.2596

Johnson, S., Cooper, C., Cartwright, S., Donald, I., Taylor, P., and Millet, C. (2005). The experience of work-related stress across occupations. *J. Manage. Psych.* 20, 178–187. doi: 10.1108/02683940510579803

Kim, L. E., and Asbury, K. (2020). 'Like a rug had been pulled from under you': The impact of COVID-19 on teachers in England during the first six weeks of the UK lockdown. *Br. J. Educ. Psychol.* 90, 1062–1083. doi: 10.1111/bjep.12381

Kinnunen, U., Feldt, T., and Mäkikangas, A. (2008). Testing the effort-reward imbalance model among Finnish managers: The role of perceived organizational support. *J. Occup. Health Psychol.* 13, 114–127. doi: 10.1037/1076-8998.13.2.114

Kyriacou, C. (2001). Teacher stress: directions for future research. *Educ. Rev.* 53, 27–35. doi: 10.1080/00131910120033628

Laursen, B. P., and Hoff, E. (2006). Person-centered and variable-centered approaches to longitudinal data. *Merrill-Palmer Q.* 52, 377–389. doi: 10.1353/mpq.2006.0029

Lerkkanen, M.-K., and Pakarinen, E. (2021). *Teacher and Student Stress and Interaction in Classroom (TESSI)*. Finland: Jyväskylä, University of Jyväskylä.

Lesener, T., Guys, B., Jochmann, A., and Wolter, C. (2020). The drivers of work engagement: A meta-analytic review of longitudinal evidence. *Int. J. Workplace Health Manag.* 34, 259–278. doi: 10.1080/02678373.2019.1686440

Lo, Y., Mendel, N. R., and Rubin, D. B. (2001). Testing the number of components in a Normal mixture. *Biometrika* 88, 767–778. doi: 10.1093/biomet/88.3.767

Lubke, G. H., and Muthén, B. (2005). Investigating population heterogeneity with factor mixture models. *Psychol. Methods* 10, 21–39. doi: 10.1037/1082-989X.10.1.21

MacIntyre, P. D., Gregersen, T., and Mercer, S. (2020). Language teachers' coping strategies during the Covid-19 conversion to online teaching: correlations with stress, wellbeing negative emotions. *System.* 94:102352. doi: 10.1016/j.system.2020.102352

Maslach, C., Schaufeli, W. B., and Leiter, M. P. (2001). Job Burnout. *Annu. Rev. Psychol.* 52, 397–422. doi: 10.1146/annurev.psych.52.1.397

Ministry of Education and Finnish Institute for Health and Welfare (2020). Terveyden ja hyvinvoinnin laitoksen ja opetus- ja kulttuuriministeriön suositus yliopistoille, ammattikorkeakouluille sekä lukiokoulutuksen, ammatillisen koulutuksen, vapaan sivistystyön ja aikuisten perusopetuksen järjestäjille koronavirusepidemian aikana. [Government Policy for Universities, Universities of Applied Sciences, General Upper Secondary Education, Vocational Education, Liberal Education, Adult Education during the Coronavirus.] Available at: https://okm.fi/documents/1410845/22330894/OKM+THL+suositus+oppilaitoksille+ja+korkeakouluille+4.8.2020.pdf/25573c91-57c1-8e6d-d7a0-8f515c647896?t=1596550914841 (Accessed December 1, 2021).

Minkkinen, J., Auvinen, E., and Mauno, S. (2020). Meaningful work protects teachers' self-rated health under stressors. *J. Posit. Psychol.* 4, 140–152. doi: 10.47602/jpsp.v4i2.209

Montgomery, C., and Rupp, A. A. (2005). A meta-analysis for exploring the diverse causes and effects of stress in teachers. *Can. J. Educ.* 28, 458–488. doi: 10.2307/4126479

Muthén, L. K., and Muthén, B. O. (1998). *Mplus User's Guide. 7th Edn*. Los Angeles, CA: Muthén & Muthén.

Nielsen, K., Nielsen, M. B., Ogbonnaya, C., Känsälä, M., Saari, E., and Isaksson, K. (2017). Workplace resources to improve Both employee well-being and performance: A systematic review and meta-analysis. *Work Stress* 31, 101–120. doi: 10.1080/02678373.2017.1304463

Norvapalo, K. (2014). *The Quality and Development of the Leader-Follower Relationship and Psychological Capital: A Longitudinal Case Study in a Higher Education Context*. University of Jyväskylä: Jyväskylä Studies in Business and Economics.

Nylund, K. L., Asparouhov, T., and Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Struct. Eq. Model Multidisciplinary J.* 14, 535–569. doi: 10.1080/10705510701575396

Nylund-Gibson, K., and Masyn, K. E. (2016). Covariates and mixture modeling: results of a simulation study exploring the impact of Misspecified effects on class enumeration. *Struct. Eq. Model Multidisciplinary J.* 23, 782–797. doi: 10.1080/10705511.2016.1221313

Perera, H. N., Vosicka, L., Granziera, H., and McIlveen, P. (2018). Towards an integrative perspective on the structure of teacher work engagement. *J. Voc. Behav.* 108, 28–41. doi: 10.1016/j.jvb.2018.05.006

Pöysä, S., Pakarinen, E., and Lerkkanen, M.-K. (2021). Patterns of teachers' occupational well-being during the COVID-19 pandemic: relations to experiences of exhaustion, recovery, and interactional styles of teaching. *Front. Educ.* 6:699785. doi: 10.3389/feduc.2021.699785

Rantanen, J., Feldt, T., Hyvönen, K., Kinnunen, U., and Mäkikangas, A. (2012). Factorial validity of the effort-reward imbalance scale: evidence from multi-sample and three-wave follow-Up studies. *Int. Arch. Occup. Environ. Health* 86, 645–656. doi: 10.1007/s00420-012-0798-9

Salmela-Aro, K., Hietajärvi, L., and Lonka, K. (2019). Work burnout and engagement profiles Among teachers. *Front. Psychol.* 10:2254. doi: 10.3389/fpsyg.2019.02254

Salmela-Aro, K., Rantanen, J., Hyvönen, K., Tilleman, K., and Feldt, T. (2011). Bergen burnout inventory: reliability and validity among Finnish and Estonian managers. *Int. Arch. Occup. Environ. Health* 84, 635–645. doi: 10.1007/s00420-010-0594-3

Salmela-Aro, K., Upadyaya, K., and Hietajärvi, L. (2020). Suomalaisten rehtorien ja opettajien työhyvinvointiprofiilit koronakeväänä [Work-related well-being profiles among Finnish school teachers and principals during the spring of Covid-19]. *Psykologia.* 55, 426–443.

Schaufeli, W., and Bakker, A. (2004). Utrech Work Engagement Scale. Preliminary Manual. Utrecht: Utrech University. Available at: https://www.wilmarschaufeli.nl/publications/Schaufeli/Test/20Manual/Test_manual_UWES_English.pdf (Accessed December 5, 2021).

Schaufeli, W., Bakker, A. B., and Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-National Study. *Educ. Psychol. Meas.* 66, 701–716. doi: 10.1177/0013164405282471

Schaufeli, W., and Salanova, M. (2013). "Burnout, boredom and engagement at the workplace," in *An Introduction to Contemporary Work Psychology*. eds. M. C. Peeters, J. Jonge and T. W. Taris (England: Wiley-Blackwell), 293–320.

Schaufeli, W. B., Salanova, M., González-Romá, V., and Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *J. Happiness Stud.* 3, 71–92. doi: 10.1023/A:1015630930326

Schaufeli, W. B., and Taris, T. W. (2014). "A critical review of the job demands-resources model: implications for improving work and health," in *Bridging Occupational, Organizational and Public Health: A Transdisciplinary Approach*. eds. G. F. Bauer and O. Hämmig (Germany: Springer Science + Business Media), 43–68.

Seppälä, P., Mauno, S., Feldt, T., Hakanen, J., Kinnunen, U., Tolvanen, A., et al. (2009). The construct validity of the Utrecht work engagement scale: multisample and longitudinal evidence. *J. Happiness Stud.* 10, 459–481. doi: 10.1007/s10902-008-9100-y

Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *J. Occup. Health Psychol.* 1, 27–41. doi: 10.1037/1076-8998.1.1.27

Siegrist, J., Starke, D., Chandola, T., Godin, I., Marmot, M., Niedhammer, I., et al. (2004). The measurement of effort-reward imbalance at work: European comparisons. *Soc. Sci. Med.* 58, 1483–1499. doi: 10.1016/S0277-9536(03)00351-4

Simbula, S., Guglielmi, D., and Schaufeli, W. B. (2010). A three-wave study of job resources, self-efficacy, and work engagement among Italian schoolteachers. *Eur. J. Work. Organ.* 20, 285–304. doi: 10.1080/13594320903513916

Skaalvik, E. M., and Skaalvik, S. (2016). Teacher stress and teacher self-efficacy as predictors of engagement, emotional exhaustion, and motivation to leave the teaching profession. *Creat. Educ.* 07, 1785–1799. doi: 10.4236/ce.2016.713182

Skaalvik, E. M., and Skaalvik, S. (2018). Job demands and job resources as predictors of teacher motivation and well-being. *Soc. Psychol. Educ.* 21, 1251–1275. doi: 10.1007/s11218-018-9464-8

Spicksley, K., Kington, A., and Watkins, M. (2021). We will appreciate Each other more after This: teachers' construction of collective and personal identities during lockdown. *Front. Psychol.* 12:703404. doi: 10.3389/fpsyg.2021.703404

Steger, M. F., Dik, B. J., and Duffy, R. D. (2012). Measuring meaningful work: The work and meaning inventory (WAMI). *J. Career Assessm.* 20, 322–337. doi: 10.1177/1069072711436160

Travers, C. (2017). "Current knowledge on the nature, prevalence, sources and potential impact of teacher stress," in *In Educator Stress: An Occupational Health Perspective*. eds. T. M. McIntyre, S. E. McIntyre and D. J. Francis (Cham: Springer International Publishing AG), 23–54.

Ugwu, F. O., and Onyishi, I. E. (2018). Linking perceived organizational frustration to work engagement: The moderating roles of sense of calling and psychological meaningfulness. *J. Career Assess.* 26, 220–239. doi: 10.1177/1069072717692735

UNESCO (2021). UNESCO map on school closures. Available at: https://en.unesco.org/covid19/educationresponse, http://data.uis.unesco.org and UIS, October 2021(Accessed December 5, 2021).

UNESCO, UNICEF, and the World Bank (2020). What Have We Learnt? Overview of Findings from a Survey of Ministries of Education on National Responses to COVID-19. Paris, New York, Washington D.C: UNESCO, UNICEF, World Bank© License: CC BY-SA 3.0 IGO. Available at: https://openknowledge.worldbank.org/handle/10986/34700 (Accessed December 6, 2021).

UNESCO, UNICEF, the World Bank, the World Food Programme, and UNHCR (2021). Framework for Reopening Schools. Document. Available at: https://www.unicef.org/documents/framework-reopening-schools (Accessed December 5, 2021).

UNICEF (2021). Education disrupted. The second year of the COVID-19 pandemic and school closures. Publications. Available at: https://data.unicef.org/resources/education-disrupted/ (Accessed December 5, 2021).

Unterbrink, T., Hack, A., Pfeifer, R., Buhl-Griesshaber, V., Müller, U., Wesche, H., et al. (2007). Burnout and effort-reward-imbalance in a sample of 949 German teachers. *Int. Arch. Occup. Environ. Health* 80, 433–441. doi: 10.1007/s00420-007-0169-0

Van Vegchel, N., de Jonge, J., Bosma, H., and Schaufeli, W. (2005). Reviewing the effort-reward imbalance model: drawing Up the balance of 45 empirical studies. *Soc. Sci. Med.* 60, 1117–1131. doi: 10.1016/j.socscimed.2004.06.043

Vermunt, J. K., and Magidson, J. (2002). "Latent class cluster analysis," in *Latent Class Cluster Applied Latent Class Analysis*. eds. J. A. Hagenaars and A. L. McCutcheon (Cambridge: Cambridge University Press), 89–106.

Vuorio, J., Ranta, M., Korksinen, K., Nevalainen-Sumkin, T., Helminen, J., and Miettunen, A. (2021). Etäopetuksen Tilannekuva Koronapandemiassa Vuonna 2020. [report of remote teaching during the COVID-19 pandemic in year 2020.] Raportit Ja Selvitykset, 4. Available at: https://www.oph.fi/fi/tilastot-ja-julkaisut/julkaisut/etaopetuksen-tilannekuva-koronapandemiassa-vuonna-2020 (Accessed December 6, 2021).

Wang, Y., Ramos, A., Wu, H., Liu, L., Yang, X., Wang, J., et al. (2015). Relationship between occupational stress and burnout among Chinese teachers: A cross-sectional survey in Liaoning. *China. Int. Arch. Occup. Environ. Health.* 88, 589–597. doi: 10.1007/s00420-014-0987-9

Zhou, X., and Yao, B. (2020). Social support and acute stress symptoms (ASSs) during The COVID-19 outbreak: deciphering the roles of psychological needs and sense of control. *Eur. J. Psychotraumatol.* 11:1779494. doi: 10.1080/20008198.2020.1779494

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2022 Pöysä, Pakarinen and Lerkkanen. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

frontiers | Frontiers in Psychology

ORIGINAL RESEARCH
published: 23 May 2022
doi: 10.3389/fpsyg.2022.867433

Barriers to and Facilitators for Teachers' Wellbeing

Cassandra A. Gearhart, Madison Blaydes and Christopher J. McCarthy*

Department of Educational Psychology, The University of Texas at Austin, Austin, TX, United States

Teaching is widely recognized as a stressful profession, which has been connected to burnout and high turnover of qualified teachers. Despite increasing attention on teacher wellbeing, stress management interventions are often underutilized and demonstrate small effect sizes, and research on teachers' informal stress management practices and desired resources is limited. It is likely that formal and informal intervention effectiveness is limited by teachers' ability to access existing resources and navigate the complex educational systems they inhabit. The study explored the barriers to and facilitators for teachers' engagement in formal and informal stress management interventions and desired resources across socioecological levels. Thirty-two teachers participated across four focus groups. Inductive thematic analysis was used to identify relevant themes. Personal barriers (e.g., guilt about self-prioritization), environmental barriers (e.g., mixed messages about self-care), and improved campus resources (e.g., scheduled opportunities to destress) were common themes. Recommendations for supporting teachers' wellbeing include self-care affirming messages from peers and administrators, campus- and district-level changes to remove logistical barriers to stress management, and increased connectedness among campus community members.

Keywords: teacher wellbeing, public school teachers, stress management, barriers, facilitators, organizational level change, teacher stress

OPEN ACCESS

Edited by:
Simon Beausaert,
Maastricht University, Netherlands

Reviewed by:
Inken Gast,
Maastricht University, Netherlands
Simona De Stasio,
Libera Università Maria SS. Assunta, Italy

****Correspondence:***
Cassandra A. Gearhart
cassandra.gearhart@utexas.edu

Specialty section:
This article was submitted to Organizational Psychology, a section of the journal Frontiers in Psychology

Received: *01 February 2022*
Accepted: *29 April 2022*
Published: *23 May 2022*

Citation:
Gearhart CA, Blaydes M and McCarthy CJ (2022) Barriers to and Facilitators for Teachers' Wellbeing. Front. Psychol. 13:867433. doi: 10.3389/fpsyg.2022.867433

INTRODUCTION

Teachers often find fulfillment, joy, and value in their profession (Schutz, 2014). Teachers are motivated by the sense that they make a difference in children's lives and in society as a whole (Bakar et al., 2014). These experiences contribute to job satisfaction and ultimately occupational wellbeing. Teacher wellbeing in the workplace has been difficult to define. A recent empirical attempt by Fox (2021) produced a four-component definition with psychological and social elements. These four components include teacher efficacy (i.e., teachers' beliefs in their teaching abilities), teacher disposition (i.e., qualities and characteristics of the teacher), school connectedness (i.e., teachers' relationships with others in the school), and job specific stress (i.e., experiences that may hinder wellbeing when disproportionate to the three positive elements of teacher wellbeing). This definition is substantiated by the current teacher wellbeing literature which states manageable stress is a key component of wellbeing (Ouellette et al., 2018; McCarthy et al., 2019), alongside social support (Ferguson et al., 2017) and personal resources (Jennings et al., 2013). Teachers are unfortunately some of the most stressed workers, with nearly half of educators reporting high daily work stress (Gallup, 2014).

High teacher stress can have negative personal and professional implications. Teachers' high stress is associated with physical and mental health problems (Shernoff et al., 2011), increased intention to leave the field, and attrition (Ryan et al., 2017; McCarthy et al., 2019). Student wellbeing and achievement are also impacted when teachers struggle (Oberle and Schonert-Reichl, 2016; Herman et al., 2018). To further complicate the issue, teachers face a unique constellation of demands within their work environment: low student motivation, challenges disciplining students (Skaalvik and Skaalvik, 2017), burdensome workloads (Shernoff et al., 2011), and high-stakes testing (Lever et al., 2017) to name a few. There is clearly a need to address high stress experienced by teachers.

Efforts to reduce teacher stress often include stress management intervention (SMI), which intend to minimize stress through activities, programs, or organizational changes (Richardson and Rothstein, 2008; Lever et al., 2017). Interventions and policy changes can occur across socioecological levels, including individual change, individual-organizational interface change, and organizational change (Greenberg et al., 2016). Efforts to address teacher stress typically involve individual or individual-organizational interventions (Greenberg et al., 2016).

On the individual level, researchers and practitioners have implemented a variety of stress management programs, most designed to teach coping skills (e.g., mindfulness, cognitive reappraisal). These programs show modest improvements on burnout: small effects on workplace emotional exhaustion and sense of accomplishment and no effects on professional detachment with teachers (Iancu et al., 2017). In other professions (e.g., business), these programs typically yield medium to large effect sizes on similar measures of wellbeing (Richardson and Rothstein, 2008). Perhaps teachers' highly structured workplace limits engagement in and benefits from individual change interventions. Also common are individual-organizational SMIs.

Individual-organizational stress reducing efforts in education include mentorship programs for early career teachers (Ingersoll and Strong, 2011) and reimagining teacher evaluation processes (Anderson et al., 2019). These interface changes are not yet standard practice but have shown promise for reducing workplace stress (Ingersoll and Strong, 2011). Lastly, change at the organizational level has yet to truly be enacted and evaluated in education settings (Greenberg et al., 2016). Organizational interventions aim to prevent stressful workplace conditions in the first place. Open communication, reimagining job structure, and improved training have been studied in other fields, but these interventions have yet to gain traction in education (Tetrick and Winslow, 2015). Greenberg et al. (2016) call for continued basic research on teacher stress interventions across levels.

An emerging topic in the teacher stress literature examines *informal* stress management among teachers. Informal stress interventions may include self-care practices (e.g., exercise, meditation) and social interaction (e.g., meals with colleagues, unofficial mentoring). Kelly (2021) examined teachers' existing self-care strategies and found teachers use a variety of techniques, like seeking out friends and family for emotional support, reading books to promote intellectual wellbeing, and utilizing mentorship relationships for professional support. However, engagement in these activities may be hindered by barriers such as inflexible thinking, limited energy when stressed, and limited time (Barton, 2021; Kelly, 2021). Surprisingly, teachers' experiences of formal and informal SMIs are rarely, if at all, considered together. Neither are the barriers prohibiting teachers' management of occupational stress.

In the field of public health, access to intervention and care is viewed as prerequisite for health improvement (Shaw, 2012). Penchansky (1977) defined access as the necessary fit between the intervention characteristics (and contexts) and the needs of the intended population for initial and sustained engagement with health promotion systems. Yet, these authors found little to no attention paid to how SMIs are accessed by teachers. This study aims to fill this gap by exploring teachers' experiences of barriers to and facilitators for engagement in formal and informal SMIs. To further contextualize SMI barriers and facilitators, the socioecological changes teachers view as necessary to improve SMI engagement and occupational wellbeing are discussed.

MATERIALS AND METHODS

Inductive thematic analysis, a process akin to grounded theory (Glaser, 1998), was employed to explore teachers' discussions of stress management. Consistent with Glaser's formulation of grounded theory, the current study is situated in a post-positivist paradigm. This means we viewed the experiences and perceptions shared by teacher participants in this study as reflective of the experiences shared among teachers more generally, while also being a product of ever-changing contexts. From this perspective, it is appropriate to describe the contexts surrounding and within focus groups, such as the local COVID-19-related regulations and frequency at which topics were discussed, as this information can shed light on how teachers experienced the conditions of their work-life at the time of data collection. The following sections detail the procedures for data collection and analysis. All procedures were approved by the Institutional Review Board at the University of Texas at Austin.

Focus Group Format and Procedure

Focus groups were chosen for data collection as they allow participants to react and respond to one another thus generating a variety of responses, which aligns with the study goal of uncovering the breadth of wellbeing barriers and facilitators. Focus groups were conducted in partnership with a community mental health clinic located in schools. Clinic staff and school counselors facilitated scheduling and advertising for the focus groups. Groups were facilitated by the first author, a doctoral student in an American Psychology Association-accredited counseling psychology program, and assisted by a fourth-year undergraduate student majoring in human ecology. A total of four focus groups were conducted; two at elementary schools, one at a middle school, and one at a high school. All four schools belonged to the same large public school district. The first two focus groups (one at an elementary school and one at a middle school) were conducted in person just prior to local

government shutdowns due to the novel COVID-19 virus (i.e., early March 2020). The last two groups (one elementary and one high school) were conducted virtually during shelter-in-place orders in April 2020. These two groups were conducted *via* Zoom video conferences during the school day. The number of teachers who chose to participate did not substantially vary between the two focus group formats [x^2 (3, N = 32) = 0.75, p = 0.86].

Participant recruitment was consistent across all focus groups. Campus-wide emails were sent advertising the topics of discussion, participation incentives (i.e., $15 Target gift card and snacks for in-person focus groups), and assuring confidentiality. Interested teachers responded to the first author; no respondents were denied participation. Reminder emails were sent 2 days prior to and the day of focus groups. Some procedures had to change when focus groups went virtual; these differences are described next.

Focus Group Protocol

A 1-h, semi-structured protocol was followed for all focus groups. The complete protocol covered teachers' sources of stress, coping strategies, available supports, barriers to and facilitators for resource use, and desired resources. The facilitator overviewed the generative goal of these focus groups, set norms for voicing alternative views, and communicated the importance for respecting confidentiality. Focus group questions most relevant to the current study included (1) What kinds of support services are currently available for stress management?, (2) What are the barriers to accessing these resources, (3) What facilitates use of these resources?, and (4) What are some other teacher stress management resources you think would be helpful for teachers at your school? It became clear during the first focus group that discussions needed to include a broader definition of stress management, as teacher often discussed individual self-care practices alongside formal campus resources and system-level policies. Probes were added across all focus groups to allow for a wider range of discussion. Teachers were encouraged to build on one another's thoughts and help guide the discussion. Minimal redirection was needed.

In-Person Focus Group Procedures

Paper research consent forms were provided. Major points were covered then teachers were provided time to read over the form and ask questions. Signed consent forms were collected. Teachers had the option to provide work history in education (e.g., years teaching) and demographic information (e.g., race, gender) on tablets during the first 15 min of each group. A semi-structured protocol was then followed (see Focus Group Protocol below). Participants were given $15 gift cards for their participation.

Virtual Focus Group Procedures

A Qualtrics survey was used to obtain written consent to participate in research the day prior to focus groups. Teaching history and basic demographic information was also collected in this survey. Focus groups were conducted *via* Zoom.us. Meeting information, including password, were provided to participants *via* email. The second author verified all participants had completed the consent survey before the focus group commenced. Participants received digital $15 gift cards within 24 h of focus group participation.

Participants

A total of 32 teachers participated across the four focus groups. To better understand the variety of perspectives across teaching faculty, recruitment was open to any staff member considered a member of school faculty. Nearly all grade levels, specializations, and educational roles were represented (i.e., prekindergarten through twelfth grade, special education, core and elective subjects, assistant teachers, librarians). Members of administration and non-faculty staff were excluded from participation in the current study. Of the 32 participants, 27 opted to provide demographic information. This information is reported in **Table 1**.

Campus Characteristics

The two elementary schools, one middle school, and one high school included in the study were from the same independent public school district in the United States Southwest. Each school was assigned a pseudonym prior to analysis: Live Oak Elementary, Ash Middle, Mesquite High, and Juniper Elementary. All four schools were primarily populated with Hispanic/Latinx (25.7–73.0%) and White (14.3–54.8%) students, and Hispanic/Latinx (16.4–41.2%) and White (54.7–71.6%) teachers. Focus group participants reflected the distribution of early career teachers, racial and ethnic makeup within their respective schools. The percentage of economically disadvantaged students varied substantially between schools (19.9–72.7%), with Juniper elementary school qualifying as a Title 1 school for the 2019–2020 school year.

Data Analysis

Inductive thematic analysis unfolded in three stages: data preparation, codebook creation, excerpting, and code application. These processes are described next.

Data Collection and Preparation

All audio files underwent transcription. For in-person focus groups, audio recorders were used to capture audio data. Audio files were stored in an encrypted, cloud-based storage platform prior to and during professional transcription. For virtual focus groups, meetings were recorded through Zoom.us. Autogenerated meeting transcripts were checked against the audio recording, and updated as necessary. Encrypted, cloud-based storage through Zoom.us was used throughout the process. Microsoft Word documents were used for transcripts. Names, places, and other identifying information were then redacted. Audio files and recorded meetings were permanently deleted after transcription. Narratives were then housed on Dedoose.com, a cloud-based qualitative analysis platform.

Substantive Coding and Codebook Creation

In the first phase of analysis, data-derived codes were taken from the first two focus group transcripts. In preparation for

TABLE 1 | Participant demographics.

Factor	Live Oak Elementary	Ash Middle	Mesquite High	Juniper Elementary	Overall
Focus group format	In-person	In-person	Virtual	Virtual	-
Number of participants	10	8	7	7	32
Number of participants who provided demographics	7	6	7	7	27
Average teaching experience (years)	18.6	17.5	9.6	19.1	16.13
Average age (years)	51.3	45.3	41.4	50.1	47.1
Gender (%)					
Male	0	16.7	14.3	0	7.4
Female	100	83.3	85.7	100	92.6
Race/ethnicity (%)					
White	14.3	83.3	42.9	71.4	51.9
Hispanic/Latinx	71.4	16.7	14.3	14.3	29.6
African or African-American	14.3	0	0	0	3.70
Asian or Asian-American	0	0	14.3	0	3.70
Biracial or multiracial	0	0	28.6	14.3	11.1

Teacher demographic information is provided by focus groups and across the sample. Theme and subtheme frequencies indicate the number of excerpts in which a specific theme appeared. Excerpts were created within transcripts to capture complete thoughts and provide consistent data segments for coding.

this process, two coders, the first author and an undergraduate student, shared expectations and biases they felt might sway the sorting process. This awareness allowed for an open conversation of bias throughout the coding process. Each coder then read through a transcript and summarized statements in a word or two. The goal in this phase was to create codes without conceptualizing teachers' statements. Coders' arising thoughts were noted and used during code sorting to further refine research questions, akin to theoretical memos in grounded theory (Glaser, 1998).

Data-derived codes were transferred to Mac's Stickies application. Each substantive code received a sticky note. Coders then met virtually to sort codes thematically. This process yielded five preliminary themes that were then compared to authors' process notes and existing theory. This process of constant comparison between existing data, ongoing notes, and theory continued through multiple iterations of induction and deduction until data-driven themes and subthemes took shape. The resulting themes and subthemes were defined and hierarchically organized into a codebook.

Excerpt Creation and Code Application

In the next stage of analysis, transcripts were excerpted into sections of text that captured teachers' thoughts on sources of stress, coping strategies, stress management barriers or facilitators, or desired resources by the first author. These excerpts then served as consistent pieces of text for coding. Two coders, the second author, a doctoral student, and an undergraduate student, independently applied codes to excerpts then met virtually to discuss discrepancies and omissions. A consensus approach was used to determine final codes. When the two initial coders could not come to consensus, a third member of the research team, the first author, would join the discussion and make the final determination. This procedure was applied across coding phases, which included (a) pilot testing the initial codebook, (b) adjusting the coding process into two stages, and (c) verifying final codes. Each phase is described below.

The initial codebook was pilot tested on the Live Oak Elementary and Mesquite High excerpts. During code comparison meetings, revisions were made to the codebook based on patterns of disagreement and confusion. Revisions included the addition of child codes not previously captured and further dividing commonly occurring codes. The final codebook was then applied to the remaining two focus group transcripts with minor adjustments along the way. The coding procedure shifted halfway through due to inadequate interrater reliability.

Cohen's kappa was run to assess interrater reliability, or the clarity with which emergent themes represent the data (McHugh, 2012). This is done by calculating the level of agreement between independently assigned codes. Cohen's kappa also takes into account random agreement, or code agreement for reasons due to chance selection. Interrater was run throughout the coding process.

Early on in the coding process, moderate agreement was obtained when the complete codebook was applied to the Juniper Elementary transcript ($\kappa = 0.66$; McHugh, 2012). Given the complexity of the codebook (i.e., over 70 codes across four themes), the coding process was simplified to better assess the ability of the codebook and coders to distinguish between subthemes within major themes. To do this, coders independently determined whether excerpts discussed one or more of the major themes (i.e., stressors, coping mechanisms, barriers/facilitators to stress management, and desired resources). This was done for the last transcript, Ash Middle. Disagreements were discussed and final parent codes applied. Next, coders followed the same process to apply child codes according to previously determined parent codes. Interrater reliability at this level was almost perfect ($\kappa = 0.91$; McHugh, 2012).

Lastly, all final codes were reviewed for consistency. Possible inconsistencies were highlighted then discussed as a group until consensus was reached. Final code frequencies were calculated (see **Table 2**). Two of the four major themes are

TABLE 2 | Code frequencies.

Code	Live Oak Elementary	Ash Middle	Mesquite High	Juniper Elementary	Total
Stress Management Barriers and Facilitators	46	59	41	23	169
Personal factors	15	25	8	12	60
Self-prioritization Beliefs	15	20	5	10	50
Barriers	15	15	5	10	45
Facilitators	0	5	0	0	5
Awareness	0	5	3	2	10
Barriers	0	3	2	2	7
Facilitators	0	2	1	0	3
Environmental Factors	29	33	31	10	103
Social Climate	6	9	7	1	23
Barriers	5	7	3	0	15
Facilitators	1	2	4	1	8
Administrative Factors	9	9	2	3	23
Barriers	7	6	0	2	15
Facilitators	2	3	2	1	8
District Factors	1	5	1	3	10
Barriers	1	4	1	1	7
Facilitators	0	1	0	2	3
Service Factors	8	5	11	3	27
Barriers	5	3	7	1	16
Facilitators	3	2	4	2	11
Campus Facilities	5	5	10	0	20
Barriers	5	3	7	0	15
Facilitators	0	2	3	0	5
Behavioral Factors	2	1	2	1	6
Barriers	2	1	1	1	5
Facilitators	0	0	1	0	1
Desired Resources	28	21	27	24	100
Individual	0	2	0	4	6
Autonomy	0	2	0	4	6
Campus	25	15	27	20	87
Colleague Support	5	3	3	4	15
Administrative Support	10	8	5	16	39
Parent Support	0	2	0	0	2
Facility Resources	10	2	19	0	31
District	2	4	0	0	6
Calendar Changes	1	4	0	0	5
Community Partnerships	1	0	0	0	1
Community	1	0	0	0	1

included in this study: stress management barriers/facilitators and desired resources.

FINDINGS AND DISCUSSION

The following results were collected at the onset of the COVID-19 pandemic in spring 2020. Two focus groups were conducted in-person just weeks prior to shelter-in-place orders and the following two focus groups were conducted while virtual teaching was occurring. As noted in the methods, participation did not significantly differ between modalities. However, differences were found in overall theme frequencies. Barrier and facilitating factors were discussed more than would be expected during the Ash Middle school focus group and less than expected during the Juniper Elementary group [x^2 (3, N = 32) = 15.78, p = 0.001]. These differences may have less to do with focus group mode and more to do with administrative differences between schools. The majority of teacher participants at Ash Middle felt supported by their administrators and provided a wide range of other environmental barriers to and facilitators for SMI engagement, whereas the teacher participants at Juniper Elementary spoke extensively about changes they felt were necessary at the school administration level and spent less time exploring barriers and facilitators. Overall, the frequency at which teachers discussed desired resources did not differ between focus groups. Next, the

theories used to ground findings [i.e., Bandura's (1986) triadic reciprocal causation model and McLeroy et al.'s (1988) ecological model of health behavior] and emergent themes' relevance to SMI access are discussed.

Teachers' Experiences of Stress Management Barriers and Facilitators

To address the first and second goals of this study, factors that hinder and support teachers' management of stress were identified. Bandura's (1986) social-cognitive theory felt particularly relevant for organizing and understanding emergent themes. The triadic reciprocal causation model, of social-cognitive theory, was used to group ideas: (a) personal factors, such as experiences of guilt over prioritizing one's self and lack of awareness of resources; (b) environmental factors, such as unconducive campus facilities, social stigma, unsupportive administration, incompatible district policies, and inconvenient service characteristics; and (c) behavioral patterns, such as emotional suppression and reinforced boundary setting (see **Figure 1** for a visual representation). Bandura's emphasis on the complex, bidirectional relationships fit well with the often entangled personal (e.g., feeling pressed for time) and environmental (e.g., unclear administrator expectations) experiences described by teachers. Themes within these areas are described next.

Personal Barriers to Stress Management

Teachers frequently discussed the ways thoughts, feelings, and lack of resource awareness hindered their ability to manage stress, or personal barriers. Feelings of guilt about prioritizing personal needs over others' needs and navigating time pressures were common and often overlapped, which led to their grouping under self-prioritization beliefs. The self-prioritization beliefs barrier was the most frequently discussed of all barrier themes. Conversations about guilt included taking time off when ill, losing time with family, and utilizing high demand resources: "That guilt of 'I'm using a [therapy] slot,' a time slot that maybe a kid [student] could use and I'm struggling with that." Personal (e.g., spending time with one's children) and occupational (e.g., paperwork) time pressures also stood in the way:

> As teachers, we all want to do [our best] and meet our expectations. And the thing is that we all–as much as we tell ourselves it's not doable–we want to do it all [work and self-care]. That's how we're built. [. . .] [W]e know we can't, but yet it's that constant battle within.

Teachers' desire to bring their best effort to teaching is stifled by unrealistic workloads, which contribute to feelings of guilt about self-prioritization. Lastly, early career teachers and those new to campus were simply unaware of the mental health resources provided to them: "I literally didn't know [mental health clinic] was available to teachers. [. . .] I think it took like a good 2–3 weeks [before] I was like, 'what is [mental health clinic name]?"' Though only mentioned a few times, service awareness is a basic requirement for service access (Penchansky, 1977), which is especially important for early career teachers.

Ways Personal Factors Facilitate Stress Management

Teachers offered up examples of how they manage stress without guilt and commented on how administrators could facilitate service awareness. Some teachers shared how they think about taking time for themselves:

> I'm at a point where I have been able to put the work in to not feel guilty about that [using planning periods for yoga]. [. . .] When it comes to [self-care during] the workday, if you want me to be my best teacher and if I want my kids [students] to not be yelled at all the time, then I need that time.

The other piece of personal support, awareness of available services, focused on the new teacher experience: "I would have appreciated, like when I first came to [school name], an explanation. Like these are our services." The low frequency of personal facilitators for stress management amplifies the need to address personal barriers to formal and informal SMIs. Self-care descriptive norm feedback–sharing how common self-care practices are among faculty and indicating the positive benefits associated with increased self-care (Schultz et al., 2018)–may help teachers feel less guilty about taking time for themselves. These relatively small steps may help motivate teachers to engage in formal or informal SMIs without guilt. Not surprisingly, environmental factors were also discussed regularly and included a variety of considerations.

Environmental Stress Management Barriers and Facilitators

Teachers frequently discussed external circumstances that created barriers to and supported stress management and overall wellbeing. Five barrier themes emerged: (a) unconducive social climate, which included mental health stigma and lack of peer support; (b) inconsistent administrative support, which included siding with parents, unclear expectations, poor follow through, and mixed messages about self-care; (c) restrictive district policy, which included time consuming professional development and pressure to cover classes; (d) inconvenient service characteristics, which included location and hour constraints, capacity issues, excessive intakes processes, and prohibitive costs; and (e) campus facility issues, such as inadequate privacy and widespread campus layouts. The ways environmental contexts support stress management often mirrored barrier themes.

Barriers to Stress Management Due to Social Climate

Two social barriers were often mentioned: stigma around help-seeking and lack of teaching teams. Participants spoke of mental health stigma in schools: "There's this compound of, on top of the normal stigma, that maybe you're not fit for the job if you show any indication of having mental health concerns." Teachers also noted how social support is undermined when teaching teams are dissolved or absent in the school community: "I miss it [teaming] a lot. [. . .] At least I had a group of teachers who supported me. Now, I don't get as much support because they are all together except for me; [. . .] I'm in the science wing." Teaming was often discussed as supportive of wellbeing.

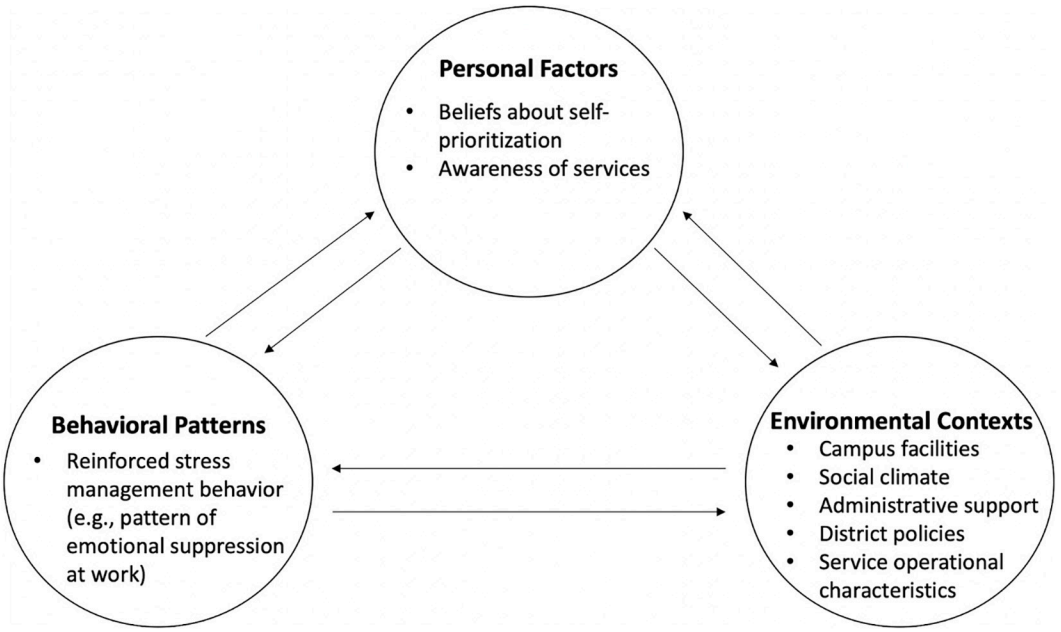


FIGURE 1 | This figure depicts the triadic reciprocal causation model, a foundational aspect of social cognitive theory (Bandura, 1986), with emergent themes for the current study. Model elements together shape educators' ability in meaningful stress management.

Ways Social Climate Facilitate Stress Management

Teaching teams and mentorship were two ways teachers experienced supportive campus climates. Teams provided support through collective boundary-setting, like ending the workday at 3:30 p.m. Team boundaries were especially helpful when working from home during COVID-19 shutdowns. Teams also provided classroom coverage:

> My team and I were so close that I never really felt alone because I always had three people who had my back. If I had to go to the bathroom, if my mom called me or something bad happened in [city name], someone could cover my class.

Near-peer support for early-career teachers was also helpful: "I wouldn't have been able to survive that [first] year at that crazy school if I didn't have the teachers that had been there 20 years showing me the ropes." Social connectedness can decrease stress and contribute to occupational wellbeing (Bermejo-Toro et al., 2016), so it is not surprising that teaching teams help teachers meet a variety of workplace demands. Interventions that address the specific connotations of mental health issues for teachers should also consider methods for reaching teachers. The support that often forms in teaching teams may provide a safe space to discuss mental health struggles and stigma.

Barriers to Stress Management Due to School Administration

Inconsistent administrative support took many shapes for teachers: frequent siding with parents, inconsistent expectations between administrators, poor implementation of teacher resources, and insincere messages about self-care. A tension was felt between administrators' intentions and actions:

> It's constant; you're getting a mixed message. Take care of yourself. Make time. But then at the same time, 'I'm going to keep adding more on without taking anything off. I recognize that I'm putting more on without taking anything off, but that's what it is.'

Also included in this frequently discussed theme was the lack of procedures for handling personal emergencies: "There's no time to process. There's no structure to support being able to leave the classroom when crises come up." On the other hand, when administrative support was discussed, it was viewed as immensely helpful.

Ways Administration Facilitate Teachers' Stress Management

Teachers valued administrators who demonstrated respect for teachers. These included turning a blind eye to district policies (e.g., signing in and out during breaks) that undermined teachers' autonomy (e.g., crossing the street to get coffee during lunch) and taking initiative on teacher concerns:

> We have a new assistant principal who I'm very impressed with, so far. If I have an issue with a student, I can talk to him about that student without having to write up a referral or send a bunch of documentation to him. I can just go talk to him, and he has actually called the student in. Then, he gets back to me, so it's not like it's just gone out in space somewhere.

Efficient meetings and meaningful use of training time were also discussed: "I think one thing that recently helped [facilitate stress management] was when we had professional development and we got to either paint or walk or do a physical activity." Taken together, genuine displays of respect and care from administrators can empower teachers to make decisions that reduce stress and support wellbeing. Administrators who view teachers as capable professionals are more likely to create a supportive environment.

Barriers to Stress Management Due to District Procedures

District-wide training requirements and pressure to cover for other teachers' during planning periods (due to a district-wide substitute shortage) hindered campus-level wellbeing: "I wouldn't say that it's a campus administration [problem]. I think it's more of the district. I think this campus administration has been phenomenal, amazing. [. . .] I think what [. . .] they make us do, is what they're being told." Teachers also spoke about challenges accessing district-provided services; in these instances, it was often difficult to determine whether the district or service or both were responsible for the challenge. These barriers appeared to be most directly connected to service characteristics, and thus were grouped as such. However, as participants pointed out, the district's role in shaping the accessibility of services (e.g., EAP counseling session limits).

Ways District Benefits Facilitate Stress Management

District-provided discounts for products and services (e.g., movie passes, gym memberships) came up a few times: "I've been using [. . .] the Calm App. They [the district] offer it, it's paid, but if you have a [district name] email, then it's free. And it's actually really awesome." While district-provided services were often valued, district initiatives, if not moderated by administrators, often felt like additional time commitments. Perhaps district leaders can give greater discretion to school administrators for adopting and implementing initiatives. Interestingly, most participants were unaware of basic employee benefits; diversified communication channels may help with awareness.

Barriers to Stress Management Due to Service Characteristics

Teachers found inconvenient locations and hours, limited client capacity, time-consuming intake procedures, and high costs to hinder help-seeking: "It's [EAP counseling is] not easy to schedule. It's not like we can schedule something at one o'clock during the weekday, [so] you're limited to Saturday sessions or evenings and those fill up really quickly." Participants frequently encountered these issues when seeking mental health services, but physical therapy and gyms were also mentioned. As was articulated previously, service accessibility issues were often connected to district decisions (e.g., employee gym inconveniently located at the district office).

Ways Service Characteristics Facilitate Stress Management

Teachers frequently discussed the benefits of co-located mental health clinics, minimal intake procedures, and low-cost services. All campuses included in this study had an on-site, non-district run mental health clinic. The limited spaces in many of these clinics and exhaustive intake procedures were drawbacks for some, but their nesting within campus culture was seen as a significant benefit by others, "I felt like I would be understood. [. . .] There's a familiarity by being at [school] that they can see what it's like. I felt like I was talking to someone who I didn't have to give a huge backstory to." While EAP hours and session limits came up as barriers, the connection to employee benefits was helpful: "I think [intake] is easier with the EAP probably because we're already in the system, and it just makes it easier. Technically, the paperwork is already there [. . .] for EAP. Insurance. Everything." There appear to be sacrifices with the two dominant approaches to providing mental health support to teachers: (a) on-site, non-affiliated clinics provide a sense of familiarity and scheduling convenience but require extensive in-take procedures and often carry a waitlist, (b) EAPs can be helpful for crisis situations or short-term therapy and have streamlined intake procedures but fail to provide continued support and require a commute. The rapid movement to telepsychology (due to COVID-19) may open new opportunities for online counseling. Policy makers should consider locations, scheduling, and community connection when deciding on mental health services.

Barriers to Stress Management Due to Campus Facilities

Teachers, who participated mostly in-person, described inadequate campus facilities for unwinding during the day, campus layouts that hindered social connection among faculty, and long walking distances that cut into break times. The spaces that were available were not suitable for destressing: "There's a designated spot for the teachers to go and work together. [. . .] It is glass [windows], so people walking by is distracting. [. . .] They [kids] see you and they want to say 'hi.' [. . .] It doesn't feel very relaxing." One school was recently constructed with two stories and two wings; when teachers moved to this new building, they noticed it was harder to stay connected with colleagues. Widespread campuses also made it difficult to get decent breaks, "I don't see the people upstairs unless we happen to cross each other in the morning or I'm coming back from lunch. [. . .] It's not like, 'hey we can chat and talk?' because the school is so widespread." Teachers who were teaching from home discussed the challenges of separating work and home life: Breaks were often filled with chores around the house. Some teachers shared helpful ways they used campus facilities.

Ways Campus Facilities Enable Stress Management

Space restrictions were less of an issue for teachers who did not have to share a classroom: "I have actually cleaned out an area in my office where I go [to meditate], and I say between this time

in this time, I am not available." Others described how dedicated teacher rooms fostered comradery:

> There was a teacher room and the administration did not go in. [. . .] Subs were not in there. Teachers could, for [lack of a] better word, bitch to each other. [. . .] It was a safe kind of place, what was said in the teachers room did not go out of the teachers room.

Colleague connection and boundaries are easier to support when designated spaces are available. As schools plan for reopening, administrators would be wise to consider how teachers will be provided space to take breaks in a safe yet meaningful way. Teachers discussed environmental and personal factors with the greatest depth and clarity. However, occasional references to behavioral patterns did emerge, and are considered next.

Barriers to Stress Management Due to Behavioral Factors

Ways in which previous behaviors influenced teachers' ability to manage stress rarely came up. The coding team often found it difficult to tease apart behavioral and cognitive influences: It was hard to tell whether views about stress management (e.g., "self-care is selfish") or a particular practice (e.g., emotional suppression) sustained teachers' challenges to wellbeing. The triadic reciprocal causation model sheds light on these challenges since the theory assumes that thoughts and behaviors influence each other as they shape psychosocial functioning (Bandura, 1986). For behavioral barriers, participants discussed patterns of suppressing emotions on the job:

> At other jobs, most of the people that I know, they can get upset and go to their workroom or go home. That's not what we do here. [. . .] We're used to sucking it up and taking it in, and then letting it out later. At that [later] time, we're probably not going to go seek any assistance because we haven't even been able to deal with that at that minute.

Participants also spoke about how disappointing outcomes from personal efforts, like failed workout routines and campus-change efforts, hindered future engagement, "You try to change things yourself and to maybe offer solutions or ideas [at school], and [. . .] there doesn't seem to be change. So I kind of figure, like, well, what's the point?" The few accounts clearly associated with behavior reinforcement were strongly connected to broader structures of the school community that made positive outcomes much less likely. On the flip side, one example of how positive outcomes can reinforce future behavior emerged.

Ways Behavioral Patterns Facilitate Stress Management

For one teacher, setting boundaries around breaks led to a shift in beliefs around taking time for themself and reinforced this behavior, "[P]eople come and hunt me down; and I'm sitting there eating [. . .]. I've learned to say, 'I need to have this 30 min to myself every day' and say, 'I can't help you right now'." Overall, the ways behaviors influence stress management were rarely discussed. This is likely because teachers were not probed to think specifically about behavioral influences. That said, reinforcement of teachers' efforts to care for themselves seems important to consider when attempting individual-organizational change. Messaging about self-care needs to be reinforced otherwise the message may lose its power.

Reciprocal relationships were frequently encountered between personal and environmental factors. Similar patterns of connectedness emerged for desired resources.

Desired Resources

The second goal of this study was to identify resources teachers felt would support stress management. Four emergent domains were modeled after McLeroy et al.'s (1988) ecological model of health behavior: individual, campus, district, and community level resources (see **Figure 2** for a visual representation). The model, which belongs to a family of socioecological models, asserts that behavior is nested within everchanging spheres of influence (i.e., intrapersonal, interpersonal, institutional, community, and policy; McLeroy et al., 1988). From this view, the emergence of mostly interpersonal and institutional resource recommendations is not surprising: teachers' stress management behaviors exist within a highly social and structured work environment.

Desired Resources at the Individual Level

Teachers desired greater control over their time usage: "Why don't they [administrators] just let me decide what to do with my time? [. . .] Let me manage it." Ways administrators can support time management are discussed at length in campus resources.

Desired Resources on Campus

Teachers had the most to say about improving resources at the campus level. Topics included interpersonal methods for improving social support (i.e., from each other, administrators, and parents) and creation of dedicated destressing spaces (i.e., work-free zones).

Interpersonal Resources

Teachers desired stronger connections with colleagues. Social activities, group follow-through on decisions, shared campus pets, and opportunities for collective discussion-making were recommended: "I think that that [discussion] is a huge piece that is missing in this [school] family. The family needs to talk." Support from school administration was also important, "I would like [administrators] to say, 'Oh, yes, you absolutely are a professional. You are a teacher, and you have all of these skills, and I trust that you're going to do these things." Teachers also recommended administrators build in time for self-care both in the daily schedule (e.g., give middle schoolers recess to allow for longer lunch periods) and through professional development: "Please value our time and don't just have us sit and go through a process of something unless it's meaningful and it's going to enhance our teaching [. . .] or feed our soul." Nearly all recommendations for improving administrative practice and policy related to increased autonomy. Administrators need to consider the underlying message sent to

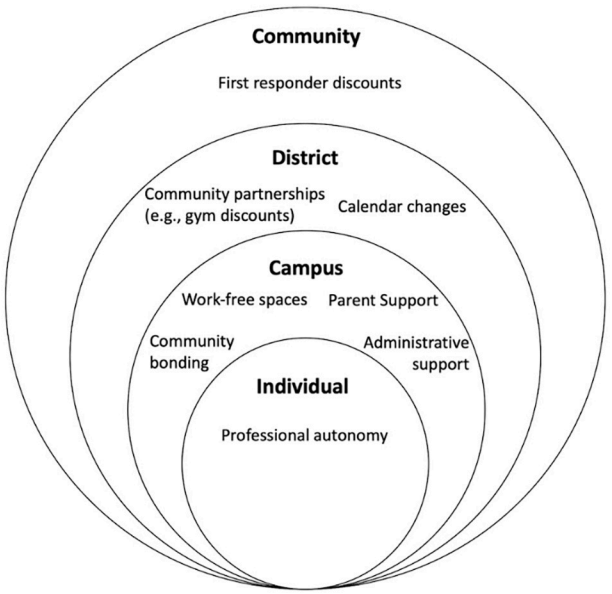


FIGURE 2 | Teachers' desired resources for well-being are shown within a socioecological framework.

teachers when implementing new policy or actively providing stress management resources.

Although infrequent, teachers wanted to see greater parent support on campus. Examples included providing meals and organizing stress relieving activities, "The parents in the community come and do things for the teachers [every Friday]—they feed them and do all these little workshops. The teachers could go if they want to, or they could just work in their rooms." Recommendations for greater parent involvement often included a desire for increased connectedness among the school community, including parents.

Facility Resources

Teachers frequently wanted on-campus relaxation spaces with soft lighting, inviting furniture, and policies prohibiting work questions:

> There needs to be a place where work is not expected to happen. [. . .] People know when I walk into that space, we're not having a work conversation. I didn't go there to find you to ask you to do an extra favor for me.

Teachers often acknowledged the importance of relaxation spaces being designated for self-care or stress management and being separate from teacher workrooms or offices.

Desired Resources at the District Level

Two district-level resources emerged: calendar changes and community partnerships. Changes to the district calendar, such a 4-day work week or year-round schooling, were recommended ways of creating breathing room in teachers' schedules:

> The school that I know that does it [year-round schooling], they have a week off at the end of every grading cycle. They have 2 weeks off at Christmas. They get spring break, and they have 6 or 8 weeks off in the summer. They still have the same amount of time that we have. It's just built differently into the school year. I just know that we go from ending one 6 weeks to starting another 6 weeks without time to even plan the next 6 weeks.

A range of non-traditional school schedules have been introduced over the past decade or so, in part due to amazingly underfunded district budgets (i.e., 4-day work weeks). Reimagining public education could include discussion of academic calendar changes.

Teachers also suggested district partnerships with local businesses to make community resources more affordable: "It'd be wonderful if there was a way to network with a gym where teachers get a discount [. . .] that's just part of your package for being an employee with [district name]." Surveying teachers on the services they want and need, while also considering accessibility, could improve the impact of district-level SMIs. Additionally, desired campus-level changes will need significant support from school districts. This connection is key to successful multilevel intervention.

Desired Resources at the Community Level

Although rare, a few participants voiced their desire for community companies to show appreciation for teachers through discounts on wellbeing services and other products:

> We get kicked and spit on and cussed at and have to deal with stuff all the time. I think that we should have the same kind of appreciation that first responders do. [. . .] Home Depot and Lowes and Planet Fitness, all these places offer [discounts] for first responders, we should be considered first responders. We are. We call them.

Interestingly, this comment was made in early March of 2020. Shortly after, a few local and national companies announced discounts for teachers (due to COVID-19). Time will tell if these benefits will last or change public perception of teachers. Teachers' recommendations across socioecological levels highlight the need for multilevel SMI.

Theme Discussion

Barriers to and facilitators for teachers' engagement in SMIs, formal and informal, fell into three domains, consistent with Bandura's (1986) triadic reciprocal causation model: personal, environmental, and behavioral. Personal and environmental barriers were the most frequently discussed domains. Notably, self-prioritization beliefs–thoughts and feelings about prioritizing ones' own self-care above work duties, student needs, or family obligations–were the themes most frequently discussed. Many teachers felt their many other responsibilities prohibited engagement in formal and informal SMIs. Teachers often noted the environmental barriers that contributed to and maintained teachers' negative thoughts and feelings on self-prioritization. This is consistent with the bidirectional relationship between elements in the triadic reciprocal causation model (Bandura, 1986). Personal and

environmental barriers and facilitators, were often described in terms of their influence on one another (e.g., teachers being required to cover for absent coworkers during planning periods perpetuated teachers' belief that their time was not respected by district and school administrators). The interplay between domains may help explain the discrepancy in SMI effectiveness between teachers (Iancu et al., 2017) and professionals as a whole (Richardson and Rothstein, 2008): While many of the most effective SMIs contain elements of cognitive reframing (in cognitive-behavioral and mindfulness-based programs; Iancu et al., 2017), the skills taught may be especially hard for teachers to enact as their social and physical work environments limit stress management autonomy in ways not experienced by most other professionals (Guo and Wang, 2021). For example, teachers in the United States are the least likely group of professionals to report their opinions matter at work (Hodges, 2018), suggesting teachers need to feel heard and empowered in their work environments before they are able to engage with stress management in a meaningful way. Teachers did provide valuable ideas for improving resources supportive of teacher wellbeing, including increased autonomy in matters of time and self-care.

The desired resources shared by teachers centered mostly on campus-level changes. The most common suggestions were to encourage social connection within faculty and support from administrators and parents. This need was highlighted by teachers experiencing community shut-downs due to the COVID-19 pandemic and adjusting to virtual instruction from home. As teachers are now back in the classroom, for the most part, social connection (in a way that feels safe) is likely a much-desired resource for teachers who often felt isolated during the pandemic-related shut-downs (Eyal et al., 2022; Gearhart et al., 2021). Increasing opportunities for and shows of social support may also address the social culture and administrative support barriers that were often connected to an unwillingness among teachers to show mental health vulnerabilities. Facilities conducive to wellbeing were also frequently discussed. Teachers felt designated spaces for relaxing support a culture of wellbeing and individual efforts to destress during the day. This recommendation was of high importance to the teachers at the one high school included in this study, possibly because these teachers lack such a space and found it difficult to ask students and other faculty to leave their classrooms during off periods and lunches.

Implications for Teacher Support

The frequently discussed negative self-prioritization beliefs illuminate one potential reason for the small effect sizes for individual-level SMIs with teachers: Simply because resources are available, does not mean teachers feel comfortable accessing them, particularly those working in high need schools with scant resources for students. Shifting the campus culture to one that values and supports wellbeing for teachers (and likely all school community members) seems necessary for effective stress management among teachers. Specific to teachers, designating professional time for stress management can demonstrate administrative support for teachers' wellbeing, and campus-wide messaging about taking time to connect with colleagues and the benefits of prioritizing self-care may facilitate meaningful and sustained engagement with formal and informal SMIs. Additionally, peer or health coaches may help circumvent setbacks due to negative views about stress management. Lastly, campus climate surveys could be used to directly ask teachers about the availability of SMI resources as well as teachers' comfort levels in accessing such resources.

The high frequency and diversity of environmental barriers to SMIs and campus-level desired resources align with Greenberg et al.'s (2016) call for the study and implementation of individual-organizational and organizational interventions. The specifics of these SMIs should be developed with campus-level contexts and teachers' needs in mind. Informal socializing and spaces to connect over non-school matters can help to deepen an already supportive campus community. These social opportunities are especially important as teachers recover from the especially trying academic years during the COVID-19 pandemic.

LIMITATIONS

The current study benefited from teachers' voices across public school settings and faculty positions. However, some limitations are important to note. First, data was collected through focus groups conducted with teachers from shared campuses. This shared experience allowed for participants to build off one another's experiences but may have also limited participants' willingness to share fully about issues of mental health or violations of school policy. Individual interviews or other private data collection processes may have changed how often stigmatized behaviors were discussed. Additionally, participants worked for the same large, public school district, and thus shared a sociopolitical context: District and community recommendations may look different in other contexts (e.g., rural areas, charter schools). The majority of teachers in this study were established in their field (i.e., more than 5 years of experience). There may be additional barriers to consider for early career teachers (Antoniou et al., 2006; Klassen and Chiu, 2010).

Lastly, data was collected during the emerging months of the COVID-19 pandemic; the situation was changing daily, and the widespread view was to take the situation day-by-day, week-by-week. It seemed teachers simply were not thinking about virtual schooling as a "new normal" but instead a temporary condition. This might explain why the conditions of virtual teaching and school shutdowns, while present in the data, did not emerge as unique themes. It is likely that some of the barriers and recommendations (e.g., designated teacher relaxation spaces) may need to look somewhat different than recommended by participants. Other recommendations may be more salient for teachers as in-person teaching has resumed in the United States and many other areas (e.g., connecting with colleagues). Despite these limitations, a wide range of views were captured.

CONCLUSION

This study provides guideposts for reducing teachers' stress across the individual-organizational continuum. Findings point to campus-level assessment of culture and intra- and interpersonal support. Incorporation of teachers in this process not only supports their much-needed autonomy, but also allows for targeted intervention. Findings emphasize the need for multilevel change, as barriers to stress management often included person-environment interaction. While the results suggest avenues for removing barriers to individual-level SMI engagement, individual intervention is limited without campus and district change. Policy changes that support teacher autonomy are important for removing barriers to teacher wellbeing.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Institutional Review Board, University of Texas at Austin. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

CG and CM contributed to conception and design of the study. CG conducted focus groups, oversaw data analysis, and wrote the first draft of the manuscript. CG and MB participated in the qualitative coding of data. MB and CM wrote sections of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

FUNDING

Support for data collection and analysis software was provided by the College of Education at the University of Texas at Austin.

REFERENCES

Anderson, D., Cameron-Standerford, A., Bergh, B., and Bohjanen, S. (2019). Teacher evaluation and its impact on wellbeing: perceptions of Michigan teachers and administrators. *Education* 139, 139–150.

Antoniou, A. S., Polychroni, F., and Vlachakis, A. N. (2006). Gender and age differences in occupational stress and professional burnout between primary and high-school teachers in Greece. *J. Manag. Psychol.* 21, 682–690. doi: 10.1108/02683940610690213

Bakar, A. R., Mohamed, S., Suhid, A., and Hamzah, R. (2014). So you want to be a teacher: what are your reasons? *Int. Edu. Stud.* 7:155. doi: 10.5539/ies.v7n11p155

Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall.

Barton, N. (2021). *Teacher Self-Care and Burnout*, Doctoral dissertation. Chicago: The Chicago School of Professional Psychology.

Bermejo-Toro, L., Prieto-Ursúa, M., and Hernández, V. (2016). Towards a model of teacher well-being: personal and job resources involved in teacher burnout and engagement. *Edu. Psychol.* 36, 481–501. doi: 10.1080/01443410.2015.1005006

Eyal, M., Gearhart, C. A., Mosley, K., and McCarthy, C. J. (2022). "Evaluation of a Teacher Stress Reduction Group During a Pandemic," in *Stress & Coping in Education: Implications for the COVID-19 Pandemic and Beyond*, eds C. J. McCarthy and R. G. Lambert (Charlotte: Information Age Publishing).

Ferguson, K., Mang, C., and Frost, L. (2017). Teacher stress and social support usage. *Brock Edu. J. Edu. Res. Pract.* 26:2. doi: 10.26522/brocked.v26i2.606

Fox, H. B. (2021). *A Mixed Methods Item Response Theory Investigation of Teacher Well-Being* Doctoral dissertation. Washington, DC: The George Washington University.

Gallup. (2014). *State of America's Schools: A Path to Winning Again in Education*. Available online at: https://www.gallup.com/services/178769/state-america-schools-report.aspx

Gearhart, C., Blaydes, M., Kelton, S. E., Balat, A. G., Mosley, K., and McCarthy, C. J. (2021). "Overwhelming and depleting": Personal and professional impacts of teaching during the COVID-19 pandemic," in *Annual Stress and Anxiety Research Society (STAR) International Conference*, Haifa.

Glaser, B. G. (1998). *Doing Grounded Theory: Issues and Discussions*. Mill Valley, CA: Sociology Press.

Greenberg, M. T., Brown, J. L., and Abenavoli, R. M. (2016). *Teacher stress and Health Effects on Teachers, Students, and Schools*. State College: Pennsylvania State University.

Guo, L., and Wang, J. (2021). Relationships between teacher autonomy, collaboration, and critical thinking focused instruction: a cross-national study. *Int. J. Edu. Res.* 106:101730. doi: 10.1016/j.ijer.2020.101730

Herman, K. C., Hickmon-Rosa, J., and Reinke, W. M. (2018). Empirically derived profiles of teacher stress, burnout, self-efficacy, and coping and associated student outcomes. *J. Posit. Behav. Interven.* 20, 90–100. doi: 10.1177/1098300717732066

Hodges, T. (2018). *Teachers Seek More Input in School Decision-Making*. Washington: Gallup.com.

Iancu, A. E., Rusu, A., Maroiu, C., Pacurar, R., and Maricutoiu, L. P. (2017). The effectiveness of interventions aimed at reducing teacher burnout: a meta-analysis. *Edu. Psychol. Rev.* 30, 373–396. doi: 10.1007/s10648-017-9420-8

Ingersoll, R. M., and Strong, M. (2011). The impact of induction and mentoring programs for beginning teachers: a critical review of the research. *Rev. Edu. Res.* 81, 201–233. doi: 10.3102/0034654311403323

Jennings, P. A., Frank, J. L., Snowberg, K. E., Coccia, M. A., and Greenberg, M. T. (2013). Improving classroom learning environments by Cultivating Awareness and Resilience in Education (CARE): results of a randomized controlled trial. *School Psychol. Quart.* 28:374. doi: 10.1037/spq0000035

Kelly, L. (2021). *Teacher Self-care: An Investigation Into the Effects of Teacher Stress Levels*. Edmonton: University of Edmonton.

Klassen, R. M., and Chiu, M. M. (2010). Effects on teachers' self-efficacy and job satisfaction: teacher gender, years of experience, and job stress. *J. Edu. Psychol.* 102, 741–756. doi: 10.1037/a0019237

Lever, N., Mathis, E., and Mayworm, A. (2017). School mental health is not just for students: why teacher and school staff wellness matters. *Rep. Emot. Behav. Disord. Youth* 17, 6–12.

McCarthy, C. J., Fitchett, P. G., Lambert, R. G., and Boyle, L. (2019). Stress vulnerability in the first year of teaching. *Teach. Educat.* 31, 1–20. doi: 10.1080/10476210.2019.1635108

McHugh, M. L. (2012). Interrater reliability: the kappa statistic. *Biochemia Medica* 22, 276–282. doi: 10.11613/BM.2012.031

McLeroy, K. R., Bibeau, D., Steckler, A., and Glanz, K. (1988). An ecological perspective on health promotion programs. *Health Edu. Quart.* 15, 351–377. doi: 10.1177/109019818801500401

Oberle, E., and Schonert-Reichl, K. A. (2016). Stress contagion in the classroom? The link between classroom teacher burnout and morning cortisol in elementary school students. *Social Sci. Med.* 159, 30–37. doi: 10.1016/j.socscimed.2016.04.031

Ouellette, R. R., Frazier, S. L., Shernoff, E. S., Cappella, E., Mehta, T. G., Maríñez-Lora, A., et al. (2018). Teacher job stress and satisfaction in urban schools: disentangling individual-, classroom-, and organizational-level influences. *Behav. Ther.* 49, 494–508. doi: 10.1016/j.beth.2017.11.011

Penchansky, R. (1977). *The Concept of Access: a Definition*. Hyattsville: National Health Planning Information Center.

Richardson, K. M., and Rothstein, H. R. (2008). Effects of occupational stress management intervention programs: a meta-analysis. *J. Occup. Health Psychol.* 13, 69–93. doi: 10.1037/1076-8998.13.1.69

Ryan, S. V., Pendergast, L. L., Schwing, S., von der Embse, N. P., Saeki, E., and Segool, N. (2017). Leaving the teaching profession: the role of teacher stress and educational accountability policies on turnover intent. *Teach. Teach. Edu.* 66, 1–11. doi: 10.1016/j.tate.2017.03.016

Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., and Griskevicius, V. (2018). The constructive, destructive, and reconstructive power of social norms: reprise. *Persp. Psychol. Sci.* 13, 249–254. doi: 10.1177/1745691617693325

Schutz, P. A. (2014). Inquiry on teachers' emotion. *Edu. Psychol.* 49, 1–12. doi: 10.1080/00461520.2013.864955

Shaw, T. C. (2012). Beyond access: extending our thinking on health policy. *Soc. Work Public Health* 27, 554–566. doi: 10.1080/19371910903183128

Shernoff, E. S., Mehta, T. G., Atkins, M. S., Torf, R., and Spencer, J. (2011). A qualitative study of the sources and impact of stress among urban teachers. *Sch. Ment. Health* 3, 59–69. doi: 10.1007/s12310-011-9051-z

Skaalvik, E., and Skaalvik, S. (2017). Dimensions of teacher burnout: relations with potential stressors at school. *Soc. Psychol. Edu.* 20, 775–790. doi: 10.1007/s11218-017-9391-0

Tetrick, L. E., and Winslow, C. J. (2015). Workplace stress management interventions and health promotion. *Annu. Rev. Organ. Psychol. Organ. Behav.* 2, 583–603. doi: 10.1146/annurev-orgpsych-032414-111341

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2022 Gearhart, Blaydes and McCarthy. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

frontiers | Frontiers in Psychology

ORIGINAL RESEARCH
published: 07 June 2022
doi: 10.3389/fpsyg.2022.873797

Newly Qualified Teachers' Well-Being During the COVID-19 Pandemic: Testing a Social Support Intervention Through Design-Based Research

Dominik E. Froehlich[1], Julia Morinaj[2], Dorothea Guias[3] and Ulrich Hobusch[4]*

[1]Centre for Teacher Education and Department of Education, University of Vienna, Vienna, Austria, [2]Department of Research in School and Instruction, Institute of Educational Science, University of Bern, Bern, Switzerland, [3]Department of Education, University of Vienna, Vienna, Austria, [4]Centre for Teacher Education, University of Vienna, Vienna, Austria

Around the world, newly qualified teachers are leaving the profession after only a short time working at school. This not only has a negative effect on the capacities of the respective education systems, but also for the teachers themselves, as it often due to factors such as stress and burnout that leads to this decision. The COVID-19 pandemic has exacerbated this situation by adding to the teachers' workload, uncertainty, and stress. Previous research has investigated strategies that may help teachers improve their well-being and, among other factors, found social support to be an important condition. In this mixed methods design-based research study, we developed a design to enhance social support among newly qualified teachers in their first months working at school. Our quantitative and qualitative results show that the design has positive effects on many aspects of teachers' well-being in the intervention group both longitudinally (before and after the intervention) and when compared to a comparison group. The findings are being discussed considering the recent changes in the working conditions of teachers as imposed by the COVID-19 pandemic.

Keywords: design-based research, newly qualified teachers, social support, well-being, teachers

OPEN ACCESS

Edited by:
Eva Kyndt,
Swinburne University of Technology, Australia

Reviewed by:
Cassandra Gearhart,
University of Texas at Austin, United States
Andrea Wullschleger,
University of Zurich, Switzerland

****Correspondence:***
Dominik E. Froehlich
dominik.froehlich@univie.ac.at

Specialty section:
This article was submitted to Organizational Psychology, a section of the journal Frontiers in Psychology

Received: *11 February 2022*
Accepted: *26 April 2022*
Published: *07 June 2022*

Citation:
Froehlich DE, Morinaj J, Guias D and Hobusch U (2022) Newly Qualified Teachers' Well-Being During the COVID-19 Pandemic: Testing a Social Support Intervention Through Design-Based Research. Front. Psychol. 13:873797. doi: 10.3389/fpsyg.2022.873797

INTRODUCTION

It is a global phenomenon that newly qualified teachers (NQTs) often leave the teaching profession within the first few years after graduation from a preservice educational program (Fantilli and McDougall, 2009; Hentges, 2012; Smith and Ulvik, 2017; Weldon, 2018). But the COVID-19 pandemic has even exacerbated the situation (Pressley et al., 2021), as it brought a whole new set of demands for teachers. Many countries experienced a total lockdown involving the immediate closure of schools and universities (Flores and Swennen, 2020) and educators at schools and teacher education institutions had to swiftly adapt to remote teaching and learning to carry on their job duties (Quezada et al., 2020). Unexpected situations such as COVID-19 aggravated the challenges with which (novice) teachers are confronted under normal circumstances; studies report increased stress and a higher propensity for depression and burnout (Anderson et al., 2021; Pressley, 2021; Santamaría et al., 2021). Importantly, these new demands also need to be seen in the context of generally increased stress levels due to

the pandemic itself—for example, through health issues in family or oneself, or caretaking responsibilities (Froehlich, 2021)—and the probability of increasing them even more (Bakker et al., 2005; Bakker and Demerouti, 2007). Also in the Austrian context, a recent study showed that the additional workload and the lack of digital skills are a great burden for teachers (Woltran et al., 2021).

Intention to leave the profession is associated with various factors, including a lack of helpful collegial relationships in preservice education, low-quality orientation programs, unhelpful mentoring, dissatisfaction with working conditions (e.g., high workload), disappointment with the school system, and a lack of commitment (Kelly et al., 2019; Räsänen et al., 2020). On the other hand, turnover intention has been found to decrease when teachers experience a higher degree of well-being (Arnup and Bowles, 2016; Chang et al., 2017; Grant et al., 2019; White and McCallum, 2020). Hence, teachers' well-being can serve as an important catalyst for commitment to the teaching profession and intentions to remain in their current job (Klusmann et al., 2008; McCallum, 2020). It was repeatedly found that teacher social and emotional well-being are strongly related to the teaching quality and that it is instrumental in enhancing pupils' success, achievement, and satisfaction (Jennings and Greenberg, 2009; White and McCallum, 2020). One key to overcoming turnover intention may be found in social support. Social support, the "perception or experience that one is cared for, esteemed, and part of a mutually supportive social network" (Taylor, 2011, p. 192), has been found to increase well-being (Helliwell et al., 2014; Beausaert et al., 2021) and the competencies necessary to navigate the current volatile context (Froehlich, 2021; Van Tilburg et al., 2021).

But while some basic research on the topic exists, this did not yet help to solve the problem in practice so far. Therefore, we attempt to build a bridge to translate the existing theories into a specific implementation in practice. This is even more relevant, since this is about an implementation during the COVID-19 pandemic—and we yet do not fully understand how the increased use of digital means affects the concept of social support (Froehlich, 2021). To provide a cost-efficient solution, we are interested in one specific form of social support, namely, the social support received from peers (i.e., from other NQTs), especially through digital exchange (due to the constraints imposed by COVID-19). Specifically, we seek to explore how NQTs' well-being may be enhanced through social support in a digital setting: Does a digital intervention to increase peer social support help NQTs to develop greater well-being? For this, we apply design-based research (A. Bakker, 2018), a scientific approach of developing practical interventions ("designs") and testing them in the field with the goals of (a) learning something new for science and (b) having a direction impact in the field. In particular, we devise a theory-driven design (Bakker and Van Eerde, 2015) to foster social support in a digital setting and teachers' well-being. This design is then evaluated using qualitative and quantitative data.

Through this intervention and subsequent evaluation, we aim to make the following two major contributions. First, we study digital social support in the volatile context of COVID-19 and how it may help with improving NQT's well-being. While there has been some focus in the literature on NQT's social support in recent years (e.g., Cooper and Stewart, 2009; Baker-Doyle, 2012; Moolenaar, 2012; Thomas et al., 2020), we extend this research by focusing on social support delivered through digital means and NQT's in the context of a global pandemic. It is indeed important to re-check the usefulness of social support in this digitized context, as the forced reliance on more digital means of communication may have changed the nature of social support quite fundamentally and, therefore, more research in this direction has been called for (Froehlich, 2021). Second, the approach of design-based research is also very fruitful in terms of the practical implications we can derive from it. The design is not only an important element of this research to generate new knowledge, but also a template to provide easily applicable strategies aimed at increasing teachers' social support and, in turn, well-being. Again, this is much needed especially during the crisis condition, in which the public funds are severely constrained by higher public health expenses (*cf*. Coccia, 2021). We aim to make these contributions in three steps: In the first part, we review the theoretical approaches that we used to develop the design. We then describe how we implemented the design and collected and analyzed data both quantitatively and qualitatively. For the quantitative analyses, we checked for differences of the intervention group with a comparison group (Hypothesis 1), tested for differences across measurement points of the intervention group (Hypothesis 2), and performed an analysis about the perception of the social processes within the peer groups formed in our intervention (Hypothesis 3). With the qualitative analyses, we inductively investigated the most prevalent and important themes regarding the NQTs' well-being, their perception of the peer support, as well as their reflection on the peer support group. Last, we present and discuss the results and derive implications for both research and practice.

BACKGROUND

Teacher Well-Being

Despite the importance of teacher well-being, there is little consensus on its definition. Well-being in the teaching profession is primarily associated with job satisfaction and is often described in deficit terms: for example, a lack of stress, burnout, emotional exhaustion, or problems with retention (Roffey, 2012; Schiefele et al., 2013; Hall-Kenyon et al., 2014; Mattern and Bauer, 2014; Breeman et al., 2015; Yildirim, 2015; Lavy and Eshet, 2018). Other researchers defined teacher well-being as a positive emotional state, resulting from harmony between teachers' environmental and personal factors (e.g., Aelterman et al., 2007; Brouskeli et al., 2018) and as a main driver of teacher effectiveness (Duckworth et al., 2009). A recent systematic review of the research literature on teacher well-being (Hascher and Waber, 2021) showed that the definition and the operationalization of teacher well-being differ across the studies. Studies on teacher well-being vary in regard to the number and choice of subdimensions, whereby the predictors, indicators, and outcomes

of teacher well-being are not clearly differentiated. Hascher and Waber (2021) provided support for the multidimensional approach to teacher well-being, in which positive dimensions outperform negative dimensions and suggested to consider the specific working context of the teaching profession. Many scholars agree that well-being is best understood as a multidimensional concept, consisting of several distinct but related dimensions (e.g., Fraillon, 2004; Soutter et al., 2014; Borgonovi and Pál, 2016). For example, building on Ryff (1989) and Warr's (1994) theoretical conceptualizations, Van Horn et al. (2004) proposed a multidimensional model for occupational well-being, consisting of affective, cognitive, professional, social, and psychosomatic dimensions. Although the model was designed for the specific working context of teachers, there was no clear definition of (teacher) well-being, which does not allow to understand the reasons for the selection of the five dimensions. As with any multidimensional model, it may be necessary to investigate the relationships between the dimensions of well-being within the model. Hascher (2004, 2012) introduced a multidimensional model of well-being in the school context, comprising positive and negative dimensions, which can be used as indicator categories of well-being in school. The model has primarily been used in the context of student well-being and address the subdimensions address cognitive, affective, and physical elements. According to Hascher (2004), well-being in school can be conceptualized as the prevalence of positive emotions and cognitions toward school, persons in school, and the school context over the negative feelings and cognitions toward school life. A high degree of well-being in school indicates the dominance of positive experiences (i.e., positive attitudes toward school, enjoyment in school, and positive academic self-concept) over the negative ones (i.e., worries in school, physical complaints, and social problems in school).

The focus on and applicability in the school setting allowed to introduce the model regarding well-being in the teaching profession. Accordingly, teachers would have higher levels of well-being when they experience more positive emotions and cognitions versus less negative ones. Teacher well-being may thus be viewed as "a positive imbalance," with the prevalence of positive aspects (Hascher and Waber, 2021). Teachers may simultaneously experience feelings of joy, happiness, and satisfaction in teaching along with worries, stress, frustration, and physical complaints associated with interactions with students or their parents, or pressures in the work environment such as lack of time and work overload (Soini et al., 2010). Positive experiences in school can coexist with negative experiences like positive dimensions of well-being can coexist with negative ones (Collie and Martin, 2017; Lavy and Eshet, 2018). Investigating positive aspects such as positive emotions at work simultaneously with the negative ones such as worries or physical complaints was strongly suggested by the recent systematic review on teacher well-being (Hascher and Waber, 2021), because the predominance of positive experiences does not exclude the existence of the negative ones. Teachers' meaningful interactions with students and colleagues or a deeper sense of teaching may function as buffers against the job demands and challenging situations teachers face in school. Similarly, if teaching is evaluated as successful and in line with its objectives, this leads to satisfaction and teacher well-being (Bieri, 2006).

In this study, we follow the multidimensional model of well-being in school (Hascher, 2004), which allows us to simultaneously scrutinize teachers' positive as well as negative experiences in the school context and encompasses factors that are specifically related to the teaching profession.

Social Support

The construct of social support is defined and operationalized differently across studies. For example, Cobb (1976) has argued that social support is "information from others that one is loved and cared for, esteemed and valued, and part of a network of communication" (p. 300). More recent research is increasingly differentiating between the various forms and types of social support (Rhodes, 2004; Froehlich et al., 2017). Hogan et al. (2002) reviewed 100 studies and illustrated that social support can be defined in more general terms as "an exchange between providers and recipients" and described three major types of supportive social interactions (Hogan et al., 2002, p. 382). First, emotional support entails care and concern which can be expressed through verbal and nonverbal communication. Second, informational support involves the provision of information which can be useful for a recipient. Third, instrumental support pertains to the provision of services and material commodities. Similarly, a study involving schoolteachers measured perceived social support using instrumental (provision of assistance and services) and emotional support (provision of caring behaviors and understanding; Ju et al., 2015).

In addition, social support can come from a variety of sources (e.g., family, friends, peers, and supervisors; Ford et al., 2007). French et al. (2018) differentiated between support forms (behaviors vs. perceptions), sources (broad vs. specific), and types (instrumental vs. emotional) and defined social support as "psychological or material resources provided through social relationships that can mitigate strains" (p. 288).

Previous research has repeatedly shown that social support plays an essential role in well-being (Chu et al., 2010; Rueger et al., 2016; Van Tilburg et al., 2021) and interacts with coping following stressful experiences (Bal et al., 2003). Positive and supportive relationships with significant others may serve as a coping resource in teachers' lives when faced with a stressful or challenging event in school. Building on Lazarus and Folkman's (1984) appraisal model of stress, assuming that stress results from imbalances in demands and resources, McCarthy et al. (2016) suggested a model of the appraisal process with teachers. According to this model, teachers appraising their social support (as resources) as equal to or exceeding demands they face in the teaching profession will experience less stress and feel more satisfied with their job, which may result in teacher well-being. On the contrary, teachers appraising their social support as insufficient will be more likely to experience stress, dissatisfaction with their job, and low levels of well-being. This model can therefore be used to explain why some teachers keep going while others decide to leave the profession. To put it differently, teachers are likely to benefit from social support and express

more favorable well-being when they believe that they have supportive social networks and know that someone can help when they are in need.

Especially during the first few years in the teaching profession, the availability and quality of social support as well as socialization structures (e.g., teacher induction and mentorship support) can play a crucial role among NQTs in their decisions to stay in or leave the profession (Joiner and Edwards, 2008; Fantilli and McDougall, 2009). Many studies confirmed that social support can serve as an important resource to cope with work overload, stress, and burnout (Maslach et al., 2001; Brackett and Mayer, 2003; Beausaert et al., 2016, 2021; Harwood and Froehlich, 2017). Involvement in social support groups of peers can provide NQTs an opportunity to develop meaningful social networks and resources to cope with stressful circumstances and job demands. The peer support group intervention of Maton (1988) suggested that it has beneficial effects on well-being and group satisfaction. This intervention also showed that bidirectional supporters reported higher well-being compared to those who engaged in only providing or receiving support.

To summarize, perceived social support and active involvement in social peer support groups may serve as a catalyst promoting NQT's well-being. The existing literature on the relationship between social support and well-being served as a basis for the intervention study with the primarily goal to investigate whether NQTs' well-being can be enhanced through social support.

MATERIALS AND METHODS

As stated above, we seek to explore how NQTs' well-being may be enhanced through social support in a digital setting. We do so by focusing on one specific design of a digital peer support group. We approach our research question through the lens of design-based research (DBR; Bakker and Van Eerde, 2015; Bakker, 2018). DBR describes a research approach increasingly used by education researchers. As a fundamental idea, DBR involves developing interventions ("designs") for real-world problems. Once a problem (field) is identified, customized interventions are then developed by referencing theory. Then, these interventions are deployed in practice and thoroughly evaluated. In essence, this approach not only tries to explore scientifically relevant knowledge (e.g., here we seek to offer another lens on how NQT's well-being may be improved), but also contains a dimension of action (as in action research): the well-being of the participating NQTs should be improved directly; a useful tool is being developed also for subsequent cohorts of NQTs (Froehlich et al., 2021). In this article, we mix quantitative and qualitative data and analyses so that these two strands of research complement each other in evaluating the design (Schoonenboom et al., 2018). Specifically, the quantitative analyses contribute information about whether the sample is somehow different or biased from the outset (see Hypothesis 1), how well-being of the NQT developed longitudinally during the intervention (see Hypotheses 2), and how the NQT's rate this process subjectively. The qualitative analyses contribute a list of topics that the NQTs were thinking about during the intervention that reflected the support they received from the peer group and its impact on their well-being. Also, they shared direct opinions about the intervention. The quantitative and the qualitative strand are integrated when discussing the results. In the following, we explicate the participants and design and then present how we collected and analyzed evaluative data to test the design.

Participants

The study participants ($n = 74$ of which 42 are in the intervention group) were NQTs at Austrian secondary schools in 2021 (i.e., during the COVID-19 pandemic). All of them, both members of intervention group and the comparison group, who were attending the same course about self-reflection and evaluation of their own teaching practice as part of their further education; when signing up, they had no knowledge of the study. In other words, group allocation happened in a quasi-random manner. Members of the intervention group were informed about the study and data collection, the reasons behind the study, as well as all relevant procedures. Participation required consent, was fully voluntary and not part of the course in any way (filling in the surveys was additional workload, it was not necessary to participate in the study, no bonus points were given, etc.).

This means that all of them were pursuing a Master's degree in teacher education, whereby entry into the school system usually happened shortly (estimate: usually 0–1 years) before that with the completion of the preceding Bachelor's program in teacher education. Importantly, the study participants were not colleagues at the same school (as sharing a formal context may bias these relationships over others in the group; Meredith et al., 2017). Also, the sample is not restricted to certain subjects. The course was designed to encourage reflection on various topics related to everyday school life and to support NQTs in developing strategies for evaluating their own teaching practice.

Since this study was conducted during the COVID-19 pandemic, it is also important to describe the wider context of what it meant to be a teacher or NQT at this point in time. While the standard mode of teaching was in the classroom, the teachers and NQTs needed to adapt quickly to digital, hybrid, or blended teaching as thousands of classrooms and hundreds of schools were quarantined and closed throughout the semester.

Design

For the intervention group, a new design was introduced, in which the NQTs were randomly assigned to peer social support groups. The group meetings were held over the course of one semester and included four to five meetings with pre- and post-meetings guided by the workbook. To give the NQTs the maximum amount of time for exchange and building social relationships, the group size was limited to four participants.

To provide an adequate and meaningful framework for the NQTs, the support groups were accompanied by a workbook,

which suggested a structure for meetings and the overall make-up of the design. Before each of the peer support group meetings, which latest approximately 40 min, the *Meeting Planning* section asked the individual participants to identify topics that are relevant to them and that could be discussed in the group meeting. This section included guiding questions such as "What is my main topic or goal for this week?," "Why is this topic important to me?," or "What can I do to get more perspective about this topic?." The *Meeting Session* section, as core part of the peer support group meeting, was structured in three stages, starting with a quick *check-in* phase (10 min), the *hot seat* (20 min), and the final *commitment* phase (10 min). The *check-in* phase provided data on the most important issues raised by participants within the previous week. The most pressing current issues and challenges of each participant were then addressed in the *hot seat* phase. Through the questions of the other group members, this phase may lead to new aspects and thus open new self-reflective perspectives. The final *commitment* phase was designed to lead participants to formulate a concrete plan for the upcoming week either to adopt changed perspectives on challenges, test new interventions, or address new issues. Participants were also given a space to record key points resulting during the group meeting. The *Meeting Review* section was designed to help participants reflect on any issues that have arisen during a meeting, approaches to solutions, or changing perspectives. We also designed a space for providing critique regarding the social support group meetings themselves to keep track of the meetings and, if necessary, improve them. Guiding reflective questions for this section include as: "What worked well in terms of the particular topic?," "What could I improve?," or "What could we change with regard to the group to make it run even better?"

Instruments

To determine an effect of social support, NQTs in the intervention group completed a questionnaire on *teacher well-being* and *social support* after each of the five group meetings. In addition, a pre-test was administered at the beginning of the study before the first intervention (peer group meeting); a post-test was administered after all (five) peer group meetings. In sum, there were seven measurement points from t0 to t6. Details on the structure and items of the teacher well-being and social support questionnaires are presented in the next section.

In addition to the quantitative survey, the workbook immanent individual reflections, preparations, and post-processing provided an opportunity to evaluate complementary content and process dimensions of the meetings. Put differently, while the quantitative data allow for making comparisons across measurement points and in relation to a comparison group, the qualitative data permit also more open analyses that investigate whether social support processes or dimensions of well-being have been addressed outside of the quantitative measurement instruments, which all have been validated before COVID-19.

Teacher well-being was assessed with the 23-item *Teacher Well-being Questionnaire* (Hascher, 2020), including six distinct dimensions of well-being: (1) positive attitudes toward school (4 items; e.g., "I like to work in school," $\alpha = 0.79$), (2) enjoyment in school (4 items; e.g., "Have you experienced joy in the past few weeks because your lessons went well?," $\alpha = 0.90$), (3) positive academic self-concept (3 items; e.g., "I do not have problems coping with the demands at school," $\alpha = 0.78$), (4) worries in school (3 items; e.g., "Have you been worried in the past few weeks about school?," $\alpha = 0.90$), (5) physical complaints in school (5 items; e.g., "Have you had in the past few weeks a severe headache because of school?," $\alpha = 0.87$), and (6) social problems in school (4 items; e.g., "Have you had in the past few weeks problems with your colleagues?," $\alpha = 0.75$). NQTs responded to statements on a 6-point Likert scale (1 = *never/disagree*; 5 = *very often/agree*). The scale was tested in a recent pilot study with a sample of Swiss secondary school teachers and the reliability was Cronbach's $\alpha = 0.68$–0.87.

The perception of *social support* was measured with the 7-item *Situation in the Team* scale at time points t1 through t6 (Diel and Schmitt, 2010; e.g., "In our support group there is a good social climate" or "In our support group we trust each other"; the word "team" from the original scale has been replaced with "support group" to fit our context). Responses were indicted on a 5-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. The internal reliability of the scale was excellent ($\alpha = 0.99$). Additionally, we used Skaalvik and Skaalvik's (2011) three items measuring *relations with colleagues* adapted for the peer group context (e.g., "Teachers in this peer group help and support each other," $\alpha = 0.90$). The scale was tested in a pilot study with Swiss secondary school teachers and the reliability was Cronbach's $\alpha = 0.92$.

The data from the quantitative surveys are completed by qualitative answers and reflections on prompts in the workbook (see description of the Design section above).

Figure 1 outlines the temporal setup of the study.

Quantitative Analyses

First, to check the assumption that the intervention group matches the comparison group in terms of well-being, we performed a cross-sectional check against NQTs enrolled in parallel courses using the Wilcoxon rank sum test (Hypothesis 1). Second, quantitative analyses also include the testing for differences across the measurement points of the intervention group (Hypothesis 2). As the data were mostly non-normal, we applied the Friedman test across three time points (t0 = pre-test, t3 = midpoint, and t6 = post-test). *Post hoc*-tests were corrected by the Bonferroni method. Last, we performed an analysis about the perception of the social processes within the peer groups (Hypothesis 3). Specifically, we evaluated the cross-sectional, subjective ratings of the questions about the functioning of the peer groups and the resulting relationships.

Qualitative Analyses

We conducted qualitative content analysis (Mayring, 2021) on the corpus of text produced in the workbooks. Out of all workbooks for which consent was obtained (over 50), we analyzed 33 before the category system became saturated. We applied an inductive approach, which included the analysis of the open-ended questions in the workbook. Through this coding

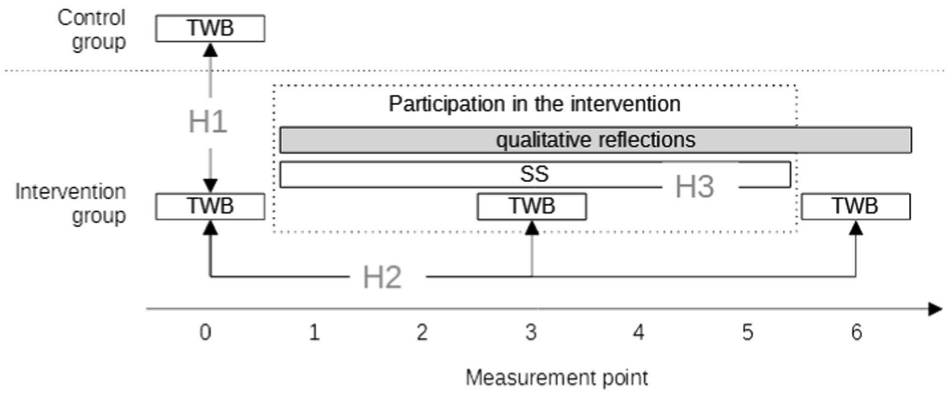


FIGURE 1 | Temporal setup of the study. TWB, Teacher Well-Being; SS, Social Support, and H, Hypothesis.

procedure we aimed to answer three questions: (1) What do the NQTs say about well-being and aspects related to well-being as discussed in literature? (2) What do the NQTs say about peer support? (3) What do the NQTs disclose about the peer support group? This process was carried out with QCAmap (Fenzl and Mayring, 2017). The qualitative analyses were led by the third author, but the coding procedures were regularly reviewed by and discussed with the first and second authors to safeguard accuracy and consistency. After the analyses were completed, the fourth author randomly sampled five workbooks from the full corpus (including those that were not analyzed due to theoretical saturation). He found that indeed all utterances of the NQTs can be mapped unto the existing category system and no revisions were suggested or made.

RESULTS

Quantitative Results

For the quantitative analyses, we started with testing the assumption that the intervention group was indeed similar to the comparison group. For this test, we compared the data of the initial measurement of the intervention group with a comparison group sampled from parallel courses. We indeed did not find any differences for positive attitudes toward school ($W = 211$, $p = 0.65$), enjoyment in school ($W = 435$, $p = 0.51$), positive academic self-concept ($W = 233$, $p = 0.97$), worries in school ($W = 463$, $p = 0.58$), physical complaints in school ($W = 555$, $p = 0.33$), and social problems in school ($W = 470$, $p = 0.85$). These findings support Hypothesis 1.

In the next step, we compared the data of the intervention group across three measurement points using Friedman's chi-squared (χ^2) test. We found statistically significant differences for enjoyment in school [$\chi^2(2) = 7.88$, $p < 0.05$, statistically significant increases from t0 to t6], positive academic self-concept [$\chi^2(2) = 21.11$, $p < 0.01$, statistically significant increases from t0 to t6], worries in school [$\chi^2(2) = 17.60$, $p < 0.01$, statistically significant decreases from t0 to t6], physical complaints in school [$\chi^2(2) = 8.64$, $p < 0.05$, statistically significant decreases from t0 to t6], and social problems in school [$\chi^2(2) = 11.08$, $p < 0.01$, statistically significant decreases from t0 to t6]. While all these changes were as expected, statistically significant differences were not found for positive attitudes toward school [$\chi^2(2) = 2.80$, $p = 0.25$]. The data back up Hypothesis 2.

These findings are further supported by the data, as participants rated the social processes within the peer group to be functioning very well ($M = 4.75$ on a 5-point scale, $SD = 0.74$). They also expressed their content with relationship outcomes ($M = 4.61$ on a 5-point scale, $SD = 0.70$). The answers to both scales deviate significantly from a neutral opinion (the midpoint of the answer scale) and thus suggest to support Hypothesis 3 (based on the assumption that a very general population would answer in a balanced way, as we would expect for a thoroughly tested measurement instrument).

Qualitative Results

Through the qualitative content analysis on the workbooks, we were able to distill the most prevalent and important themes regarding the NQTs' well-being, their perception of the peer support given over the course, as well as their reflection on the peer support group. In the following, we present the results for these three main categories.

Well-Being

Well-being was discussed in all workbooks in various forms and regarding its different aspects and implications. Every NQT was preoccupied with at least one of these aspects. The participants showed awareness of the importance of work-life balance for their well-being considering the challenges and problems they were confronted with in school. In addition to being aware of the pitfalls of over-exhaustion ("[…] this [perfectionism in lesson-planning] is at ticket to burnout and I want to avoid it"; NQT8, all translations by third author), the participants experience a lack of work-life balance and are deliberately focusing on it:

> "I want to pay particular attention to my work-life balance this week. My goal is to consciously take time for learning/working hours, to take active breaks and

> to plan more time for myself. I don't want to sit at the desk from morning to night and this about every day" (NQT4).

Beyond that NQT expressed added strain when being in contact with colleagues experiencing emotional exhaustion.

Regarding the challenges experienced by the study participants, several themes seemed especially important to participants: online teaching and COVID-19, future-related matters, teacher–student relationships, as well as teacher–parent relationships. Given the global pandemic situation, the support group participants were involved in unpredictable circumstances at school. For example, one NQT noted as: "Constantly changing rules that bring a lot of ambiguity in school and also break the routines are extremely frustrating and tiring. For the children as well as for us" (NQT5). In the same passage, the participant expressed the hope to find "a good way of dealing with it" (*ibid*.) through the discussions in the peer support group. Related to this aspect was the topic of online teaching and its associated challenges, especially not "loosing" children who are, for instance, quarantined (*cf*. NQT33). Furthermore, NQTs were confronted with worries, some of them quite general regarding organization, teaching, and dealing with problems and new situations. Other worries regarded the prospects of teachers, like finding an apprenticeship. Another challenging aspect, mentioned by NQTs, was related to relationships with students' parents. By advocating for their children, parents are prone to deny cooperation with teachers, in some cases going to the extreme of personal threats (*cf*. NQT2) and accusations (*cf*. NQT3).

In contrast to the before mentioned challenges, there were more specific themes, including challenges with individual pupils or classrooms, such as harassment among pupils and (intentional) disruptive behavior of individuals, which affect the teaching process. One study participant illustrates one pupil as having language barriers, which creates a challenge of adequate inclusion and treatment. Questions arising in this situation regard handling not only language barriers, but also tackling the problem of bullying (*cf*. NQT3). The workbook's content further provided information about the NQTs' handling of the challenges and problems they face. NQTs mentioned a variety of coping mechanisms such as looking for answers and solutions in literature, seeking discussion with other colleagues, and sharing their experiences on managing stressful situations with one another.

Another aspect affecting NQTs' well-being is teachers' attitude toward school and teaching. It can be concluded that NQTs are highly engaged in their teaching and want to offer pupils a safe space and beneficial conditions for learning and individual development. These efforts are illustrated by the following utterance:

> "For me, the students are still the focus of my teaching, and I would also describe my teaching activity as student-friendly. It is important to consider the personal aspects and pathos of the individual student and not only to see them as objects to be taught" (NQT22).

Moreover, some NQTs emphasized on the importance of satisfaction, that is, the enjoyment needed in their job. It seems to be of great importance to be aware of one's own effort and that the job is done in the best possible way. This points to another aspect of the well-being construct: the academic self-concept, that is, what teachers conceptualize as being a professional or, in other words, "a good teacher." While there are few remarks on the kind of teachers the participants want to be(come), there are representations of handling different circumstances, which implicitly disclose deliberations that indicate a professional attitude toward teaching-related matters.

Social Support

As far as social support is concerned, the analysis reveals following: The NQTs emphasize commonalities such as similar pedagogical approaches (NQT19) and experiences important with regard to being able to understand what each one is going through. The group meetings primarily consist of exchange of experiences, feedback, tips, coping strategies, as well as the development of solutions for problems and planning of viable actions. It seems, however, that the commonalities are an underlying condition for the exchange to be perceived as supportive. Thereby, the NQT observe a contribution to their overall well-being:

> "We give each other advice; often one person has experienced a similar situation. I also noticed that sometimes we have very similar topics or that we are all the same with stress, a lot of work, etc. It's good to know that others are like that too!" (NQT4)

The overall peer support group climate also speaks of a supportive environment and is described by the NQTs in the words "supportive," "appreciative," and "relaxed." One participant's review on the third meeting concluded as:

> "At the moment, all colleagues are treated in a relaxed and appreciative manner. Making things up, helping each other, laughing together and talking about personal things – all this has worked out great lately" (NQT13).

Indeed, most of the NQTs perceived one another as sincerely engaged in the meetings and the topics discussed. They experienced a respectful exchange in, what they called, a "good manner," that is, everyone was willing and able to contribute and share their thoughts, experiences, and worries.

About the Design

Regarding the design, the NQTs reflected about the conditions for a successful peer support group. First, they identified the need for coordination between the participants. Captured in one's daily routine, which comes with a lot of work and time constraints, there is a great need of coordination regarding meeting times. Second, both, adequate equipment (internet connection) as well as an appropriate environment (quiet room, with the possibility of little distraction) are important.

One participant reported of participating in the meeting from school, which turned into meeting technical difficulties on the school's computer and being interrupted by pupils, which lead to the realization of premeditation and better organization (*cf.* NQT31). Third, a "safe space" for exchange needs to be guaranteed. NQTs need to be able to feel like they can open up with and trust one another in order to have fruitful, helpful discussions. This is particularly highlighted by two participants struggling with it, due to reasons of confidentiality (*cf.* NQT14) and lack of familiarity with one another (*cf.* NQT3).

Alongside the above-mentioned conditions, the NQTs noted a few points that could further improve the underlying design. Those recommendations included enhanced guidelines for individual as well group-wise preparation for the sessions. As a "group rule" every group member should prepare the topics of discussion in advance and the group should at least formulate its intentions for the next meeting. Furthermore, every meeting should follow clear goals, which should drive the discussions. Some groups had repeatedly experienced deviations from the actual goal they set for the specific meeting. While some concluded that they were fine with the open approach (*cf.* NQT9), others might have viewed this as counterproductive and insisted on the importance of re-focusing (*cf.* NQT2). Finally, rules for communications, like when and how much the participants should talk, as well as a "rule for confidentiality" (NQT3) should be implemented.

Choosing a moderator for each meeting was considered an important task at the beginning of each session. It was mentioned that defining roles for each meeting may contribute to a more structured and thereby fruitful discussion with every person having a fair time to facilitate the discussion.

Two other points concerned the temporal aspect. While NQTs emphasize the need of taking more time for the sessions and the need of having a flexible time frame to not experience time pressure, one participant expressed the need of setting a clear time frame for the meetings to constrain the conversation and make it more productive (*cf.* NQT20). Lastly, specifically concerning the online format, the NQTs underline the importance of being able to see the other peer group members, even if it is only through technology. Being able to interact with the other peer support group participants in a video-based format improved not only the communication but the perception of this design as a whole.

In conclusion, the following was hold in prospect regarding the peer support group: "This system was new to me, but I firmly believe that everyone can benefit from it. Hopefully, it will be implemented in other seminars, as I have learned more through it than in most pedagogical seminars put together" (NQT7).

DISCUSSION

The present study explored well-being of NQTs and the potential benefits of peer support for NQTs' well-being in a digital setting, using a sample of NQTs in Austria. Previous studies linked peer social support to well-being among NQTs. Our data complement this literature by focusing on a narrow domain: We evaluated one specific design in the specific context of the COVID-19 pandemic. Therefore, the present research contributed to research on social support and well-being in two major ways. First, we focused on a particularly critical and vulnerable time in the teaching profession and studied the sample of teachers in the beginning of their career. It has been repeatedly reported that many novice teachers leave the profession during the first years (e.g., Achinstein, 2006; Fantilli and McDougall, 2009; Hentges, 2012; Smith and Ulvik, 2017); the primary reasons for leaving have been found to be the starting teaching experience, working conditions, and the lack of support (Achinstein, 2006; Rots et al., 2007). While the COVID-19 pandemic did exacerbate the solution directly by adding further stress on the NQTs, it also affected well-being in an indirect way by blocking one known alleviation—social support. Recent studies have shown that in the on-going pandemic not the quantity of social interactions, but their quality is important for an individual's well-being (Prinzing et al., 2021; Van Tilburg et al., 2021, p. 202). Based on this premise, the designed intervention provides a space in a digital environment for developing quality relationships with other novice teachers and allows to monitor the changes in participants' well-being. We assessed the utility of a fully digital peer support group to investigate whether this still is a viable option in an era of physical distancing.

Second, we devised a theory-driven peer support group intervention to provide NQTs the opportunity to engage in providing and receiving emotional and social support and to explore the potential benefits of peer support on NQTs' well-being. Next to the research-related outcomes and contributions of this study, it is important that it also delivers an evidence-based, low barriers template for a practical intervention into teacher's well-being.

The quantitative results showed promising effects for most dimensions of well-being. Despite the relatively low sample sizes (that are, however, quite common to design-based research approaches), even statistical significance was achieved for five out of six dimensions of well-being. This points toward the usefulness of the designed social support group to improve NQT's well-being. The areas of improvement are also echoed by the qualitative findings—the categories that were discussed in the workbooks match with the dimensions present in our theoretical model of teacher well-being. These findings are in line with the theoretical frame presented above (e.g., Bal et al., 2003; Chu et al., 2010; Rueger et al., 2016; Van Tilburg et al., 2021).

The one dimension where we did not find a statistically significant effect is positive attitudes toward school, as the NQTs did not score higher in this dimension comparing the pre-test, the post-test, and the measurement in between. This can be explained because while attitudes can sometimes change swiftly, they are resistant to change at other times; especially strong attitudes, those that are important to us, may not change very quickly (Rydell et al., 2006). In so far, it seems unsurprising that the effect could not be captured in the relatively short time frame of this study.

Both the quantitative findings and qualitative results about social support implied that the design is useful for NQT's well-being. While this is an important finding on its own, it needs to be complemented with further research to investigate in how far it is useful *enough* to retain NQTs in schools. For example, this may include more longitudinal research that directly captures retention and intentions to leave as main concepts—this may also be a useful approach to investigate direct effects on the positive attitude toward school, for which our study setup was arguably too short. This especially also includes a closer study of the comparison group; in our particular, study setup the return of data for the comparison group was too little to perform longitudinal analyses. Also, further variations and iterations of the design may be tested for practical improvement purposes. For instance, this may include social support groups also including coaches or more senior teachers (see, e.g., Hasbrouck, 1997), although previous research does indicate that peers are preferred by the NQTs themselves (Colognesi et al., 2020). As outlined in the results, a qualitative theme emerged that participants, too, valued the connection that was created among equals. That said, trust achieved *via* "closure" is only one of the two major pathways to social capital creation as discussed by Burt (2001, 2005), the other one, brokering across (formal) group's boundaries, may bring a different set of benefits (but, of course, also challenges). In addition, further research may investigate how individuals' attribute moderates the effectiveness of the design (previous research has identified different teacher profile when it comes to autonomy and collaboration, which could be relevant here, too; Vangrieken et al., 2017; Vangrieken and Kyndt, 2020).

The social processes in the support group were evaluated by the NQTs to be functioning extremely well. This was echoed also in the qualitative analyses. Still, we consider it a meaningful pathway for the future to collect data that is more sensible to the details of this subject. A more fine-grained scale, or a relational approach such as social network analysis (Froehlich, 2021), may be useful tools that allow for more detailed implications.

It is a strength of design-based research to focus on one specific context and design. However, it also is a limitation when it comes to generalizability (which, however, was not a goal of this study). Replications in more contexts, and especially heterogeneous contexts, are needed to investigate the generalizability of the design. Also, social support was measured at a rather abstract level that just identified two stakeholders: the individual NQT and the rest of the group. While this approach is not uncommon in the field (Froehlich et al., 2017, 2021; Beausaert et al., 2021), other methods that take a more granular perspective—such as social network analysis (Froehlich and Brouwer, 2021)—may be more useful for identifying the role of individuals' attributes (e.g., the competence to give or take social support) and individual relationships.

Last, we discuss implications for practice and for further improvement of the design. The feedback received by the NQTs through the workbook was very direct and detailed and was already presented in the results; we, therefore, refrain from repeating these points here. The majority of the points mentioned address the "norming stage" of group development (Johnson et al., 2002). NQTs could be given more guidance in the process of defining group norms and expectations of individuals, for example, by respective notes and reflective exercises in the workbook or asynchronous trainings (to maintain the low-cost nature of the design). Also, the proposition of meeting roles (such as moderators or timekeepers) may be a useful addition to give structure to the meetings. In general, these points may also be seen from the perspective of competency already hinted at above: In how far are NQTs competent in this type of setting to provide and take social support adequately or, aiming higher, in an optimal way? Further resources and training for group participants in terms of how to be a productive peer-coach and a peer-coachee may be useful (Robbins, 1991; Eriksen et al., 2020).

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The used scales were reviewed and approved by University of Bern as part of the WESIR project. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

DF, JM, and UH: conception and design and revised the manuscript. DF and UH: obtaining data. DF: quantitative analysis. DG: qualitative analysis. DF and JM: drafted the manuscript. All authors contributed to the article and approved the submitted version.

FUNDING

Open Access publication fees were paid for by the University of Vienna.

REFERENCES

Achinstein, B. (2006). New teacher and mentor political literacy: reading, navigating and transforming induction contexts. *Teachers Teach.* 12, 123–138. doi: 10.1080/13450600500467290

Aelterman, A., Engels, N., Van Petegem, K., and Pierre Verhaeghe, J. (2007). The well-being of teachers in Flanders: the importance of a supportive school culture. *Educ. Stud.* 33, 285–297. doi: 10.1080/03055690701423085

Anderson, R. C., Bousselot, T., Katz-Buoincontro, J., and Todd, J. (2021). Generating buoyancy in a sea of uncertainty: teachers creativity and well-being during

the COVID-19 pandemic. *Front. Psychol.* 11:614774. doi: 10.3389/fpsyg.2020.614774

Arnup, J., and Bowles, T. (2016). Should I stay or should I go? Resilience as a protective factor for teachers' intention to leave the teaching profession. *Aust. J. Educ.* 60, 229–244. doi: 10.1177/0004944116667620

Baker-Doyle, K. J. (2012). First-year teachers' support networks: intentional professional networks and diverse professional allies. *New Educator* 8, 65–85. doi: 10.1080/1547688X.2012.641870

Bakker, A. (2018). *Design Research in Education: A Practical Guide for Early Career Researchers*. London: Routledge.

Bakker, A. B., and Demerouti, E. (2007). The job demands resources model: state of the art. *J. Manag. Psychol.* 22, 309–328. doi: 10.1108/02683940710733115

Bakker, A. B., Demerouti, E., and Euwema, M. C. (2005). Job resources buffer the impact of job demands on burnout. *J. Occup. Health Psychol.* 10, 170–180. doi: 10.1037/1076-8998.10.2.170

Bakker, A., and Van Eerde, D. (2015). "An introduction to design-based research with an example from statistics education," in *Approaches to Qualitative Research in Mathematics Education*. eds. A. Bikner-Ahsbahs, C. Knipping and N. Presmeg (Berlin: Springer), 429–466.

Bal, S., Crombez, G., Van Oost, P., and Debourdeaudhuij, I. (2003). The role of social support in well-being and coping with self-reported stressful events in adolescents. *Child Abuse Negl.* 27, 1377–1395. doi: 10.1016/j.chiabu.2003.06.002

Beausaert, S. A. J., Froehlich, D. E., Devos, C., and Riley, P. (2016). Effects of support on stress and burnout in school principals. *Educ. Res.* 58, 347–365. doi: 10.1080/00131881.2016.1220810

Beausaert, S. A. J., Froehlich, D. E., Riley, P., and Gallant, A. (2021). What about school principals' well-being? The role of social capital. *Educ. Manage. Administration Leadersh.* doi: 10.1177/1741143221991853 [Epub ahead of print].

Bieri, T. (2006). "Lehrpersonen: Hoch belastet und trotzdem zufrieden?" in *Lehrpersonen: Hoch belastet und trotzdem zufrieden? Schulpädagogik, Fachdidaktik, Lehrerbildung. Vol. 12*. ed. T. Bieri (Bern: Haupt).

Borgonovi, F., and Pál, J. (2016). A framework for the analysis of student well-being in the PISA 2015 study: being 15 In 2015. *Organ. Econ. Co-operation Dev.* doi: 10.1787/5jlpszwghvvb-en

Brackett, M. A., and Mayer, J. D. (2003). Convergent, discriminant, and incremental validity of competing measures of emotional intelligence. *Pers. Soc. Psychol. Bull.* 29, 1147–1158. doi: 10.1177/0146167203254596

Breeman, L. D., Wubbels, T., van Lier, P. A. C., Verhulst, F. C., van der Ende, J., Maras, A., et al. (2015). Teacher characteristics, social classroom relationships, and children's social, emotional, and behavioral classroom adjustment in special education. *J. Sch. Psychol.* 53, 87–103. doi: 10.1016/j.jsp.2014.11.005

Brouskeli, V., Kaltsi, V., and Maria, L. (2018). Resilience and occupational well-being of secondary education teachers in Greece. *Issues Educ. Res.* 28, 43–60.

Burt, R. S. (2001). "Structural holes versus network closure as social capital," in *Social Capital: Theory and Research*. eds. N. Lin, K. S. Cook and R. S. Burt (Aldine de Gruyter), 31–56.

Burt, R. S. (2005). *Brokerage and Closure: An Introduction to Social Capital*. Oxford: Oxford University Press.

Chang, C.-P., Chiu, L.-Y., and Liu, J. (2017). A study on the relationship between well-being and turnover intentions among rural school teachers: school organizational climate as a moderating variable. *Creat. Educ.* 8, 523–538. doi: 10.4236/ce.2017.84041

Chu, P. S., Saucier, D. A., and Hafner, E. (2010). Meta-analysis of the relationships between social support and well-being in children and adolescents. *J. Soc. Clin. Psychol.* 29, 624–645. doi: 10.1521/jscp.2010.29.6.624

Cobb, S. (1976). Social support as a moderator of life stress. *Psychosom. Med.* 38, 300–314. doi: 10.1097/00006842-197609000-00003

Coccia, M. (2021). High health expenditures and low exposure of population to air pollution as critical factors that can reduce fatality rate in COVID-19 pandemic crisis: a global analysis. *Environ. Res.* 199:111339. doi: 10.1016/j.envres.2021.111339

Collie, R. J., and Martin, A. J. (2017). Adaptive and maladaptive work-related motivation among teachers: a person-centered examination and links with well-being. *Teach. Teach. Educ.* 64, 199–210. doi: 10.1016/j.tate.2017.02.010

Colognesi, S., Van Nieuwenhoven, C., and Beausaert, S. (2020). Supporting newly-qualified teachers' professional development and perseverance in secondary education: On the role of informal learning. *Eur. J. Teach. Educ.* 43, 258–276. doi: 10.1080/02619768.2019.1681963

Cooper, M., and Stewart, J. (2009). 'Learning together, shaping tomorrow': new teachers try new ways. *Res. Comp. Int. Educ.* 4, 111–123. doi: 10.2304/rcie.2009.4.1.111

Diel, E., and Schmitt, L. (2010). Fragebogen zur Situation im Kollegium, im Team. Hessischer Referenzrahmen Schulqualität (HRS). Qualitätsbereiche IV "Professionalität" und V "Schulkultur". Stand: Dezember 2010. IQ.

Duckworth, A. L., Quinn, P. D., and Seligman, M. E. P. (2009). Positive predictors of teacher effectiveness. *J. Posit. Psychol.* 4, 540–547. doi: 10.1080/17439760903157232

Eriksen, M., Collins, S., Finocchio, B., and Oakley, J. (2020). Developing students' coaching ability through peer coaching. *J. Manag. Educ.* 44, 9–38. doi: 10.1177/1052562919858645

Fantilli, R. D., and McDougall, D. E. (2009). A study of novice teachers: challenges and supports in the first years. *Teach. Teach. Educ.* 25, 814–825. doi: 10.1016/j.tate.2009.02.021

Fenzl, T., and Mayring, P. (2017). QCAmap: Eine interaktive Webapplikation für Qualitative Inhaltsanalyse. *Zeitschrift für Soziologie der Erziehung und Sozialisation*. 37, 333–339.

Flores, M. A., and Swennen, A. (2020). The COVID-19 pandemic and its effects on teacher education. *Eur. J. Teach. Educ.* 43, 453–456. doi: 10.1080/02619768.2020.1824253

Ford, M. T., Heinen, B. A., and Langkamer, K. L. (2007). Work and family satisfaction and conflict: a meta-analysis of cross-domain relations. *J. Appl. Psychol.* 92, 57–80. doi: 10.1037/0021-9010.92.1.57

Fraillon, J. (2004). Measuring student well-being in the context of Australian schooling: discussion paper. Wellbeing, The Australian Council for Educational Research. Available at: https://research.acer.edu.au/well_being/8

French, K. A., Dumani, S., Allen, T. D., and Shockley, K. M. (2018). A meta-analysis of work–family conflict and social support. *Psychol. Bull.* 144, 284–314. doi: 10.1037/bul0000120

Froehlich, D. E. (2021). Career networks in shock: an agenda for in-COVID/Post-COVID career-related social capital. *Merits* 1, 61–70. doi: 10.3390/merits1010007

Froehlich, D. E., Beausaert, S. A. J., and Segers, M. S. R. (2017). Development and validation of a scale measuring approaches to work-related informal learning. *Int. J. Train. Dev.* 21, 130–144. doi: 10.1111/ijtd.12099

Froehlich, D. E., Beausaert, S. A. J., and Segers, M. S. R. (2021). Similarity-attraction theory and feedback-seeking behavior at work: how do they impact employability? *Studia Paedagogica* 26, 77–96. doi: 10.5817/SP2021-2-4

Froehlich, D. E., and Brouwer, J. (2021). "Social network analysis as mixed analysis," in *Routledge Reviewer's Guide for Mixed Methods Analysis*. eds. A. J. Onwuegbuzie and R. B. Johnson (London: Routledge).

Froehlich, D. E., Hobusch, U., and Moeslinger, K. (2021). Research methods in teacher education: meaningful engagement through service-learning. *Front. Educ.* 6:680404. doi: 10.3389/feduc.2021.680404

Grant, A. A., Jeon, L., and Buettner, C. K. (2019). Relating early childhood teachers' working conditions and well-being to their turnover intentions. *Educ. Psychol.* 39, 294–312. doi: 10.1080/01443410.2018.1543856

Hall-Kenyon, K. M., Bullough, R. V., MacKay, K. L., and Marshall, E. E. (2014). Preschool teacher well-being: a review of the literature. *Early Childhood Educ. J.* 42, 153–162. doi: 10.1007/s10643-013-0595-4

Harwood, J., and Froehlich, D. E. (2017). "Proactive feedback-seeking, teaching performance, and flourishing amongst teachers in an international primary school," in *Agency at Work: An Agentic Perspective on Professional Learning and Development*. eds. M. Goller and S. Paloniemi (Berlin: Springer), 425–444.

Hasbrouck, J. E. (1997). Mediated peer coaching for training preservice teachers. *J. Spec. Educ.* 31, 251–271. doi: 10.1177/002246699703100206

Hascher, T. (2004). *Wohlbefinden in der Schule*. Münste: Waxmann Verlag.

Hascher, T. (2012). "Well-being and learning in school," in *Encyclopedia of the Sciences of Learning*. ed. N. M. Seel (New York: Springer), 3453–3456.

Hascher, T. (2020). *Skala zum Wohlbefinden von Lehrpersonen [Teacher well-being scale]*. Bern: University of Bern.

Hascher, T., and Waber, J. (2021). Teacher well-being: a systematic review of the research literature from the year 2000–2019. *Educ. Res. Rev.* 34:100411. doi: 10.1016/j.edurev.2021.100411

Helliwell, J. F., Huang, H., and Wang, S. (2014). Social capital and well-being in times of crisis. *J. Happiness Stud.* 15, 145–162. doi: 10.1007/s10902-013-9441-z

Hentges, J. (2012). Why do beginning teachers leave the profession? What can be done about it? *Glob. Educ. J.* 2012, 100–105.

Hogan, B. E., Linden, W., and Najarian, B. (2002). Social support interventions: do they work? *Clin. Psychol. Rev.* 22, 381–440. doi: 10.1016/S0272-7358(01)00102-7

Jennings, P. A., and Greenberg, M. T. (2009). The prosocial classroom: teacher social and emotional competence in relation to student and classroom outcomes. *Rev. Educ. Res.* 79, 491–525. doi: 10.3102/0034654308325693

Johnson, S. D., Suriya, C., Won Yoon, S., Berrett, J. V., and La Fleur, J. (2002). Team development and group processes of virtual learning teams. *Comput. Educ.* 39, 379–393. doi: 10.1016/S0360-1315(02)00074-X

Joiner, S., and Edwards, J. (2008). Novice teachers: where are they going and why don't they stay. *J. Cross-Disciplinary Perspect. Educ* 1, 36–43.

Ju, C., Lan, J., Li, Y., Feng, W., and You, X. (2015). The mediating role of workplace social support on the relationship between trait emotional intelligence and teacher burnout. *Teach. Teach. Educ.* 51, 58–67. doi: 10.1016/j.tate.2015.06.001

Kelly, N., Cespedes, M., Clara, M., and Hanaher, P. (2019). Early career teachers' intentions to leave the profession: the complex relationships among preservice education, early career support, and job satisfaction. Australian. *J. Teach. Educ.* 44, 93–113. doi: 10.14221/ajte.2018v44n3.6

Klusmann, U., Kunter, M., Trautwein, U., Lüdtke, O., and Baumert, J. (2008). Teachers' occupational well-being and quality of instruction: the important role of self-regulatory patterns. *J. Educ. Psychol.* 100, 702–715. doi: 10.1037/0022-0663.100.3.702

Lavy, S., and Eshet, R. (2018). Spiral effects of teachers' emotions and emotion regulation strategies: evidence from a daily diary study. *Teach. Teach. Educ.* 73, 151–161. doi: 10.1016/j.tate.2018.04.001

Lazarus, R. S., and Folkman, S. (1984). *Stress, Appraisal, and Coping*. Berlin: Springer.

Maslach, C., Schaufeli, W. B., and Leiter, M. P. (2001). Job burnout. *Annu. Rev. Psychol.* 52, 397–422. doi: 10.1146/annurev.psych.52.1.397

Maton, K. I. (1988). Social support, organizational characteristics, psychological well-being, and group appraisal in three self-help group populations. *Am. J. Community Psychol.* 16, 53–77. doi: 10.1007/BF00906072

Mattern, J., and Bauer, J. (2014). Does teachers' cognitive self-regulation increase their occupational well-being? The structure and role of self-regulation in the teaching context. *Teach. Teach. Educ.* 43, 58–68. doi: 10.1016/j.tate.2014.05.004

Mayring, P. (2021). *Qualitative Content Analysis: A Step-by-Step Guide*. Sage Publications Ltd.

McCallum, F. (2020). "The changing nature of teachers' work and its impact on wellbeing," in *Critical Perspectives on Teaching, Learning and Leadership: Enhancing Educational Outcomes*. eds. M. A. White and F. McCallum (Berlin: Springer), 17–44.

McCarthy, C. J., Lambert, R. G., Lineback, S., Fitchett, P., and Baddouh, P. G. (2016). Assessing teacher appraisals and stress in the classroom: review of the classroom appraisal of resources and demands. *Educ. Psychol. Rev.* 28, 577–603. doi: 10.1007/s10648-015-9322-6

Meredith, C., Van den Noortgate, W., Struyve, C., Gielen, S., and Kyndt, E. (2017). Information seeking in secondary schools: a multilevel network approach. *Soc. Networks* 50, 35–45. doi: 10.1016/j.socnet.2017.03.006

Moolenaar, N. M. (2012). A social network perspective on teacher collaboration in schools: theory, methodology, and applications. *Am. J. Educ.* 119, 7–39. doi: 10.1086/667715

Pressley, T. (2021). Factors contributing to teacher burnout during COVID-19. *Educ. Res.* 50, 325–327. doi: 10.3102/0013189X211004138

Pressley, T., Ha, C., and Learn, E. (2021). Teacher stress and anxiety during COVID-19: An empirical study. *School Psychol.* 36, 367–376. doi: 10.1037/spq0000468

Prinzing, M. M., Zhou, J., West, T. N., Le Nguyen, K. D., Wells, J. L., and Fredrickson, B. L. (2021). Staying 'in sync' with others during COVID-19: perceived positivity resonance mediates cross-sectional and longitudinal links between trait resilience and mental health. *J. Posit. Psychol.* 1–16. doi: 10.1080/17439760.2020.1858336

Quezada, R. L., Talbot, C., and Quezada-Parker, K. B. (2020). From bricks and mortar to remote teaching: a teacher education program's response to COVID-19. *J. Educ. Teach.* 46, 472–483. doi: 10.1080/02607476.2020.1801330

Räsänen, K., Pietarinen, J., Pyhältö, K., Soini, T., and Väisänen, P. (2020). Why leave the teaching profession? A longitudinal approach to the prevalence and persistence of teacher turnover intentions. *Soc. Psychol. Educ.* 23, 837–859. doi: 10.1007/s11218-020-09567-x

Rhodes, J. E. (2004). Family, friends, and community: the role of social support in promoting health. *Clin. Handb. Health Psychol.* 9, 289–296.

Robbins, P. (1991). *How to Plan and Implement a Peer Coaching Program*. Alexandria, VA: Association for Supervision and Curriculum Development.

Roffey, S. (2012). Pupil wellbeing—teacher wellbeing: two sides of the same coin? *Educ. Child Psychol.* 29:8.

Rots, I., Aelterman, A., Vlerick, P., and Vermeulen, K. (2007). Teacher education, graduates' teaching commitment and entrance into the teaching profession. *Teach. Teach. Educ.* 23, 543–556. doi: 10.1016/j.tate.2007.01.012

Rueger, S. Y., Malecki, C. K., Pyun, Y., Aycock, C., and Coyle, S. (2016). A meta-analytic review of the association between perceived social support and depression in childhood and adolescence. *Psychol. Bull.* 142, 1017–1067. doi: 10.1037/bul0000058

Rydell, R. J., McConnell, A. R., Mackie, D. M., and Strain, L. M. (2006). Of two minds: forming and changing valence-inconsistent implicit and explicit attitudes. *Psychol. Sci.* 17, 954–958. doi: 10.1111/j.1467-9280.2006.01811.x

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *J. Pers. Soc. Psychol.* 57, 1069–1081. doi: 10.1037/0022-3514.57.6.1069

Santamaría, M. D., Mondragon, N. I., Santxo, N. B., and Ozamiz-Etxebarria, N. (2021). Teacher stress, anxiety and depression at the beginning of the academic year during the COVID-19 pandemic. *Global Mental Health* 8:e14. doi: 10.1017/gmh.2021.14

Schiefele, U., Streblow, L., and Retelsdorf, J. (2013). Dimensions of teacher interest and their relations to occupational well-being and instructional practices. *J. Educ. Res. Online* 5, 7–37.

Schoonenboom, J., Johnson, R. B., and Froehlich, D. E. (2018). Combining multiple purposes of mixing within a mixed methods research design. *Int. J. Multiple Res. Approaches* 10, 271–282. doi: 10.29034/ijmra.v10n1a17

Skaalvik, E. M., and Skaalvik, S. (2011). Teacher job satisfaction and motivation to leave the teaching profession: relations with school context, feeling of belonging, and emotional exhaustion. *Teach. Teach. Educ.* 27, 1029–1038. doi: 10.1016/j.tate.2011.04.001

Smith, K., and Ulvik, M. (2017). Leaving teaching: lack of resilience or sign of agency? *Teachers Teach.* 23, 928–945. doi: 10.1080/13540602.2017.1358706

Soini, T., Pyhältö, K., and Pietarinen, J. (2010). Pedagogical well-being: reflecting learning and well-being in teachers' work. *Teach. Teach. Theory Pract.* 16, 735–751. doi: 10.1080/13540602.2010.517690

Soutter, A. K., O'Steen, B., and Gilmore, A. (2014). The student well-being model: a conceptual framework for the development of student well-being indicators. *Int. J. Adolesc. Youth* 19, 496–520. doi: 10.1080/02673843.2012.754362

Taylor, S. E. (2011). "Social support: a review," in *The Oxford Handbook of Health Psychology*. ed. H. S. Friedman (Oxford: Oxford University Press), 189–214.

Thomas, L., Tuytens, M., Davos, G., Kelchtermans, G., and Vanderlinde, R. (2020). "Unpacking the collegial network structure of beginning teachers' primary school teams: a mixed method social network study," in *Mixed Methods Social Network Analysis: Theories and Methodologies in Learning and Education*. eds. D. E. Froehlich, M. Rehm and B. C. Rienties (London: Routledge), 139–158.

Van Horn, J. E., Taris, T. W., Schaufeli, W. B., and Schreurs, P. J. (2004). The structure of occupational well-being: a study among Dutch teachers. *J. Occup. Organ. Psychol.* 77, 365–375. doi: 10.1348/0963179041752718

Van Tilburg, T. G., Steinmetz, S., Stolte, E., Van der Roest, H., and De Vries, D. H. (2021). Loneliness and mental health during the COVID-19 pandemic: a study among Dutch older adults. *J. Gerontol. Ser. B* 76, e249–e255. doi: 10.1093/geronb/gbaa111

Vangrieken, K., and Kyndt, E. (2020). The teacher as an island? A mixed method study on the relationship between autonomy and collaboration. *Eur. J. Psychol. Educ.* 35, 177–204. doi: 10.1007/s10212-019-00420-0

Vangrieken, K., Meredith, C., Packer, T., and Kyndt, E. (2017). Teacher communities as a context for professional development: a systematic review. *Teach. Teach. Educ.* 61, 47–59. doi: 10.1016/j.tate.2016.10.001

Warr, P. (1994). A conceptual framework for the study of work and mental health. *Work Stress* 8, 84–97. doi: 10.1080/02678379408259982

Weldon, P. (2018). Early career teacher attrition in Australia: evidence, definition, classification and measurement. *Aust. J. Educ.* 62, 61–78. doi: 10.1177/0004944117752478

White, M. A., and McCallum, F. (2020). "Responding to teacher quality through an evidence-informed wellbeing framework for initial teacher education," in *Teacher Education in Globalised Times: Local Responses in Action*. eds. J. Fox, C. Alexander and T. Aspland (Berlin: Springer), 115–137.

Woltran, F., Chan, R., Lindner, K.-T., and Schwab, S. (2021). Austrian elementary school teachers' perception of professional challenges during emergency distance teaching due to COVID-19. *Front. Educ.* 6:759541. doi: 10.3389/feduc.2021.759541

Yildirim, K. (2015). Testing the main determinants of teachers' professional well-being by using a mixed method. *Teach. Dev.* 19, 59–78. doi: 10.1080/13664530.2014.970663

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2022 Froehlich, Morinaj, Guias and Hobusch. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

frontiers | Frontiers in Psychology

CONCEPTUAL ANALYSIS
published: 10 June 2022
doi: 10.3389/fpsyg.2022.866571

The Use of Social Capital in Teacher Research: A Necessary Clarification

Thibault Coppe[1]*, *Laura Thomas*[2], *Nataša Pantić*[3], *Dominik E. Froehlich*[4], *Marc Sarazin*[3] *and Isabel Raemdonck*[1]

[1] Faculty of Psychology and Educational Sciences, University of Louvain, Ottignies-Louvain-la-Neuve, Belgium, [2] Department of Educational Studies, Ghent University, Ghent, Belgium, [3] Moray House School of Education and Sport, The University of Edinburgh, Edinburgh, United Kingdom, [4] Department of Education, University of Vienna, Vienna, Austria

In this paper, we present a critical reflection on the concept of social capital. We argue that there is no such idea of an umbrella concept of social capital. Instead, two overarching conceptualizations of social capital exist, namely individual social capital and collective social capital. As these conceptualizations of social capital are completely different, we emphasize that studies using social capital as a theoretical lens should clarify the concept as well as be consistent in the interpretation of the concept, from its definition to its methodological operationalization. In this article, we first map the two different conceptualizations of social capital. Next, these conceptualizations are illustrated with well-known teacher research studies, followed by examples of studies in which individual and collective social capital are mixed. Finally, we discuss the consequences of the use and the mix of these different conceptualizations in terms of measurement methods. Additionally, implications for teacher education are presented.

Keywords: social capital, teacher education, teacher research, social network, professional development

OPEN ACCESS

Edited by:
Simon Beausaert,
Maastricht University, Netherlands

Reviewed by:
Murod Ismailov,
University of Tsukuba, Japan
Katharina Maag Merki,
University of Zurich, Switzerland

***Correspondence:**
Thibault Coppe
thibault.coppe@uclouvain.be

Specialty section:
This article was submitted to Organizational Psychology, a section of the journal Frontiers in Psychology

Received: *31 January 2022*
Accepted: *02 May 2022*
Published: *10 June 2022*

Citation:
Coppe T, Thomas L, Pantić N, Froehlich DE, Sarazin M and Raemdonck I (2022) The Use of Social Capital in Teacher Research: A Necessary Clarification. Front. Psychol. 13:866571. doi: 10.3389/fpsyg.2022.866571

INTRODUCTION

Throughout the past two decades, there has been a growing body of literature that recognizes the importance of teachers' interactions for their professional development (Moolenaar, 2012; Kyndt et al., 2016; Baker-Doyle and Yoon, 2020). Teachers' professional development has increasingly been considered as a "socially embedded" phenomenon. This, in turn, has brought the concept of social capital to the forefront of the domain of teacher research. A multitude of studies have highlighted social capital as a resource for teachers' learning (Daly et al., 2020), wellbeing and job satisfaction (Edinger and Edinger, 2018), support (Bristol and Shirrell, 2019), induction (Thomas et al., 2019; März and Kelchtermans, 2020), and turnover (Hopkins et al., 2019). In line with this growing trend, emphasizing the social side of teacher development has become mainstream in teacher research nowadays, making social capital a trendy concept (Baker-Doyle and Yoon, 2020).

But even though this increasing body of teacher research seems to build on the same fundamental concept of social capital, the concept is operationalized and interpreted in various ways. Scholars do not always explicate which conceptualization of social capital they are using and often mix different conceptualizations of social capital under the same "umbrella construct".

In this paper, we argue that there is no such idea of an umbrella concept of "social capital". Instead, two overarching conceptualizations of social capital exist, namely individual social capital and collective social capital. Individual social capital (also called network-based social capital; Bourdieu, 1980; Lin, 2001) represents a potential benefit for individuals that is embedded in social interactions (such as professional resources available through relations with colleagues). Collective social capital (also called civic capital; Putnam, 1994; Paccagnella and Sestito, 2014) represents a collective good shaped by the sum of individual behaviors and is rooted in the shared culture of a collectivity (such as schools' trust climate or schools' shared positive norms). As these conceptualizations of social capital are completely different, we emphasize that studies using social capital as a theoretical lens should clarify the concept (i.e., whether an individual or collective perspective on social capital is chosen) as well as be consistent in the interpretation of the concept, from its definition to its methodological operationalization. In the teacher research domain, many papers build on a definition of individual social capital while operationalizing the social capital construct with theories and variables related to both individual and collective interpretations of social capital. The most common example of this mix is to present teachers' social capital as a combination of the trust climate of their school and the resources that teachers can access through professional interactions with peers (see below for details). Such practices can be problematic as they may result in conceptual ambiguity (Son, 2020). Theoretically speaking, it makes the concept blurry, and methodologically speaking, it is problematic to measure one construct (e.g., individual social capital) with measurement methods related to another construct (e.g., collective social capital).

In this paper, we first map the two overarching different conceptualizations of social capital, namely individual social capital and collective social capital. Next, these conceptualizations are illustrated with well-known teacher research studies, followed by examples of studies in which individual and collective social capital are somehow mixed. Finally, we discuss the consequences of the use and the mix of these different conceptualizations in terms of measurement methods. As the teacher research domain is mainly rooted in the individual social capital conceptualization instead of the collective variant, attention is especially devoted to measurement methods for the former. The main contribution this paper seeks to make to the special issue is:

- to clarify the different definitions of social capital in their scientific historical context and to provide examples of them coming from the teacher research domain,
- to highlight that individual social capital is a concept often used in teacher research,
- to discuss the consequences of mixing different conceptualizations of social capital, and
- to explore the operationalization of individual social capital.

Our aim is not to write a systematic literature review on the concept of social capital (for systematic reviews see Portes, 1998; Tzanakis, 2013; Son, 2020; Demir, 2021), but rather to critically discuss the concept, especially its use in the domain of teacher research.

MAPPING THE DIFFERENT CONCEPTUALIZATIONS OF SOCIAL CAPITAL

Understanding the Concepts of Social Capital

While some sources attribute the first use of the term "social capital" to Hanifan or Weber (Claridge, 2004), others point to Durkheim and Marx as setting out its conceptual foundations (Portes, 1998). Through the years, social capital has been used in many disciplines (i.e., economy, sociology, psychology, education, etc. Dika and Singh, 2002), and with several different meanings (i.e., capital from a social point of view; resource of the community; social commonwealth; people's social condition, etc. Farr, 2004). Current uses of social capital build particularly on the works of Bourdieu (1980), Coleman (1988), Putnam (1994), Nahapiet and Ghoshal (1998), and Lin (2001). In this section, we will not focus on the origin of the term (see Farr, 2004 for more information) but will discuss its meanings on the basis of these five more recent conceptualizations. In particular, we will briefly highlight the different conceptualizations of social capital carried out by the works of Putnam, Bourdieu, Coleman, Nahapiet and Ghoshal, and Lin (see **Table 1**) as it will help us to show that there are mainly two overarching conceptualizations of social capital, namely individual and collective social capital (Son, 2020).

Putnam (1994) proposed a definition of social capital strongly rooted in the collective idea of social capital: "Unlike conventional capital, social capital is a public good, that is, it is not the private property of those who benefit from it" (p. 10). For Putnam, social capital refers to community-level goods such as trust climate or civic engagement (mainly at macro-levels such as the state level). This conceptualization of social capital has also been called "civic capital" (Guiso et al., 2011). As an example, in his work, Putnam showed the relation between state-level social capital and the educational performance of schools (Putnam, 2001). His concept of state-level social capital was the sum of individual "civic behaviors" such as engagement in social organizations, engagement in public affairs, engagement in volunteering communities, perception of social trust, and engagement in sociability. In his conceptualization of collective social capital, Putnam distinguished bonding social capital and bridging social capital (Gittell and Vidal, 1998). Bonding social capital refers to the community-level good among a homogeneous population (within-group) while bridging social capital refers to the community-level good shaped by combination of several populations (between-group) (Leonard, 2004). This distinction has inspired later work, even the work of those rooted in an individual social capital perspective.

Coleman (1988) defined social capital both as a public good and an individual benefit. Starting from the individual perspective, he defines social capital as resources available to

TABLE 1 | Different conceptualizations of social capital (table inspired by Claridge, 2018).

	Collective social capital (also called civic social capital)	Individual social capital (also called network-based social capital)
Putnam (1994)	Social capital is a public good mostly referring to state-level social capital. It is built by citizen engagement in public affairs.	
Coleman (1988)	Social capital is resources available to actors in their network and shared norms that facilitate reciprocity.	
Nahapiet and Ghoshal (1998)	Social capital is resources available to actors in the network and shared norms and shared language that facilitate interactions.	
Bourdieu (1980)		Social capital is resources related to the possession of a durable network.
Lin (2001)		Social capital is resources embedded in one's social networks.

actors. Illustrating individual social capital, he explains that if A has a social relation with B, he can ask B to do something for him or to give him advice. Therefore, B is a resource possessed by A because of a social bond between them. Adding a collective perspective on social capital, Coleman explains that this exchange between A and B only works if they trust each other to have reciprocal exchanges. For Coleman, in a larger social environment than this dyad, individual social capital only exists when there is a form of collective social capital, such as trust and norms of reciprocity. As such, he conceptualizes collective social capital as a condition for individual social capital. In other words, "norms and sanctions (i.e., a form of collective social capital) are a necessary condition for initiating and promoting social exchanges among actors (i.e., a form of individual social capital) in a community" (Son, 2020, p. 10). Coleman differentiates individual and collective social capital, suggesting that collective social capital can represent a favorable environment to individual social capital. The work of Coleman on social capital, however, has been highly criticized (Ponthieux, 2006; Tzanakis, 2013; Tlili and Obsiye, 2014): while the distinction between individual and collective social capital is visible in his work, he has never made this distinction clear, using the same social capital term to refer to individual and collective social capital (Son, 2020). In other words "Coleman obscures the notion of social capital by including under this term mechanisms that generate social capital (such as mutual expectation and group reinforcement of norms), the consequences of possessing it (such as privileged access to information), and the 'appropriable' social organization that provides the context for the former two (sources and effects)" (Marrero, 2006, p. 5).

Close to the work of Coleman, Nahapiet and Ghoshal (1998) defined social capital as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit" (p. 243). While this definition seems to refer mainly to individual social capital, Nahapiet and Ghoshal present social capital as shaped by three dimensions that refer both to individual and collective perspectives of social capital: structural, relational, and cognitive. The structural dimension refers to the presence or absence of ties between individuals (equivalent to individual social capital). The relational dimension refers to trust between individuals and norms and sanctions as group guidelines (similar to collective social capital). Finally, Nahapiet and Ghoshal (1998) present the cognitive dimension as an addition to previous conceptualizations of social capital, referring to shared perceptions that facilitate interactions such as shared language and codes (also similar to collective social capital). These dimensions refer to the relationships and the structural features of social capital (Froehlich et al., 2020b). Parallel to Coleman, Nahapiet and Ghoshal have been criticized for mixing different concepts into the same notion. Fine (2010) wrote: "Nahapiet and Ghoshal 'throw everything from their field into social capital', including a good dose of Bourdieu" (p. 219).

In contrast to Putnam's collective view of social capital, for Bourdieu (1980), social capital is mainly an individual good that exists because of membership within a group. He defined social capital as the resources (existing or potential) that are related to the possession of a durable relational network (Bourdieu, 1980, p. 2). He used social capital to conceptualize social exchange dynamics within the ruling classes. For Bourdieu, society is clustered in communities and actors are positioned within these communities. According to their positions, they have access to different resources. As such, there are social inequalities regarding the clusters of actors and the positions of the actors within their clusters. Having more economic and cultural capital predisposes individuals to being members of different clusters and to having good structural positions within these clusters. It enables "advantageous locations in social space in the competition for the appropriation of available scarce resources" (Tzanakis, 2013).

Following Bourdieu's perspective, Lin (2001) also theorizes social capital from an individual perspective. He defines social capital as "resources embedded in one's social networks, resources that can be accessed or mobilized through ties in the networks" (Lin, 2008, p. 54). This conceptualization is also called network-based social capital (Lin, 2008). In Lin's conceptualization of social capital, trust or collective norms are explicitly not conceptualized as a form of social capital and social capital *is* individual social capital (Son, 2020).

Through the work of these authors, which represents the foundations of the two current overarching conceptualizations of social capital, we can conclude that individual social capital is the benefit that a person obtains as a function of their social position in a social network while collective social capital is

the collective good that is shaped by a community (Godechot and Mariot, 2004). Individual social capital and collective social capital are sometimes linked, such as in Coleman's conceptualization, or completely distinct, such as in Lin's and Putnam's conceptualizations. Regardless of their possible link or opposition, these authors agree that an individual form and a collective form of social capital are not the same ideas (see **Figure 1** for an illustration of these two conceptualizations). As we highlighted in this section, the work of Coleman and Nahapiet and Ghoshal has been criticized because their conceptualization of social capital tries to bring together two notions that are very different (Marrero, 2006; Fine, 2010). This duality represents a "considerable disagreement about whether social capital is a collective attribute of communities or societies, or whether its beneficial properties are associated with individuals and their social relationships" (Poortinga, 2006, p. 293). Though the disagreement in itself is not problematic, it can become a problem when "social capital" is used as an umbrella term without taking into account the debate regarding both conceptualizations. The risk here is that arguments drawing on collective and individual social capital are mixed, without (sufficient) knowledge about these two conceptualizations. In such cases, "conceptual chaos" can lead to the fall of the concept of social capital (Fine, 2010). Moreover, mixing individual and collective social capital can also pose problems with respect to research designs and operationalizations of social capital in empirical studies, which in turn may lead to incorrect conclusions.

Social Capital in Teacher Research

Like other disciplines before it, the educational sciences have also embraced the concept of social capital for its theoretical value in understanding learning and development. This is especially visible in the teacher research domain. The increasing use of the social capital concept in teacher research follows the growing consensus among educational researchers that relationships matter (Moolenaar, 2012). In the past 15 years, empirical research on teacher development using the concept of social capital have flourished significantly (Demir, 2021). The concept of social capital is also more and more used as a part of other concepts mobilized in teacher research, such as the concepts of professional capital (shaped by human capital, social capital, and decisional capital: Hargreaves and Fullan, 2012) or intellectual capital (shaped by human capital and social capital, Daly et al., 2018). The underlying assumption of this trend is that social interactions are important sources of teachers' knowledge and professional development (Coburn and Russell, 2008; Baker-Doyle and Yoon, 2011). In teacher research, teachers' interactions and collegiality dynamics are increasingly described as resources for e.g., teacher retention, professional development, engagement, support, and learning (Daly, 2010; Thomas et al.,

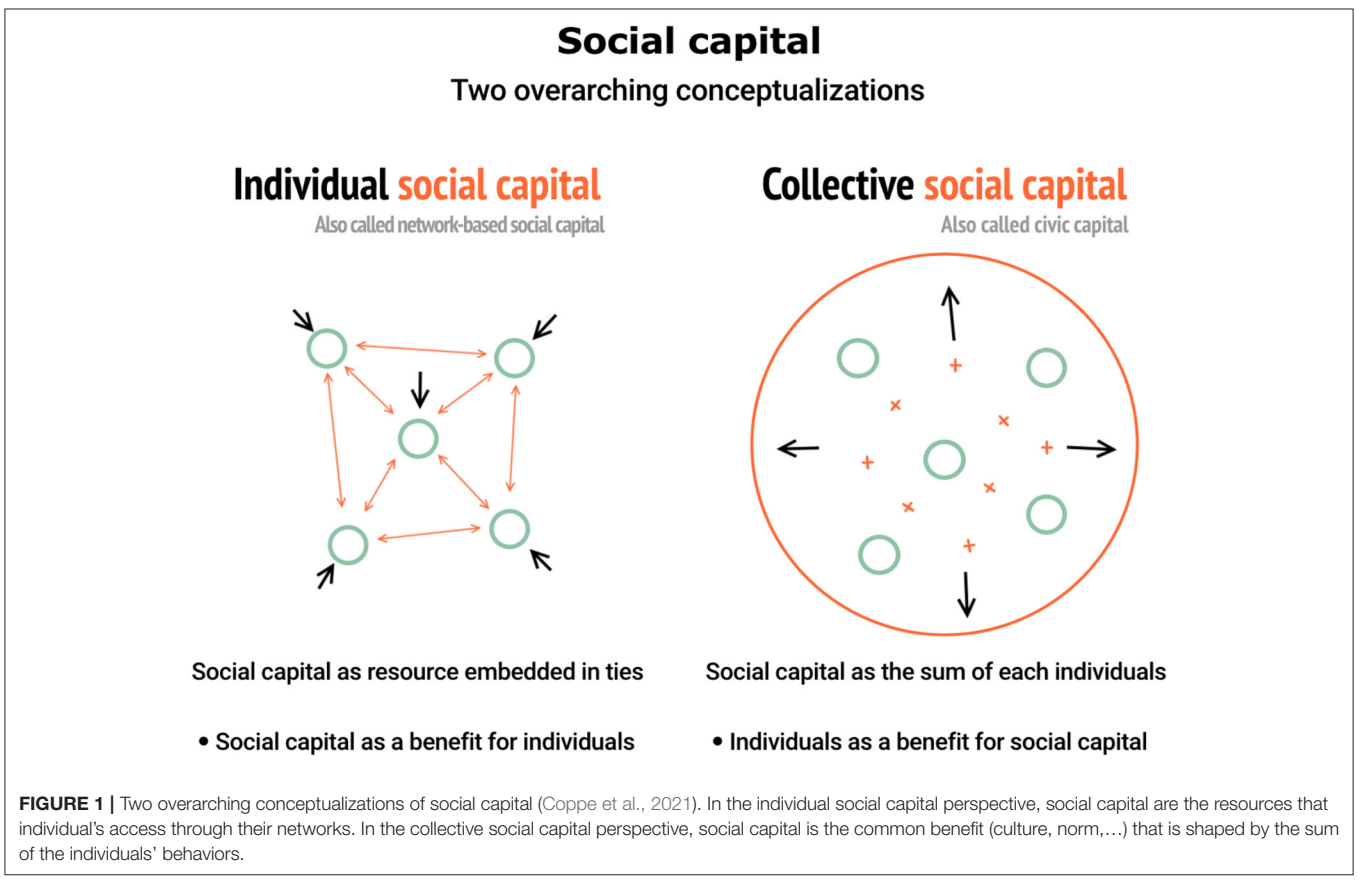


FIGURE 1 | Two overarching conceptualizations of social capital (Coppe et al., 2021). In the individual social capital perspective, social capital are the resources that individual's access through their networks. In the collective social capital perspective, social capital is the common benefit (culture, norm,…) that is shaped by the sum of the individuals' behaviors.

TABLE 2 | Examples of studies using individual, collective, or a mixed form of social capital.

	Conceptualizations	Operationalizations
Spillane et al. (2012)	Individual	Social network approach
Struyve et al. (2016)	Individual	Social network approach
Bristol and Shirrell (2019)	Individual	Social network approach
Belfi et al. (2015)	Collective	Psychometric instrument
van Maele and van Houtte (2011)	Collective	Psychometric instrument
Moolenaar et al. (2014)	Mixed form with rationale related to individual social capital	Social network approach and psychometric instrument
Hopkins et al. (2019)	Mixed form with rationale related to individual social capital	Social network approach and psychometric instrument
Liou et al. (2017)	Mixed form with rationale related to individual social capital	Social network approach and psychometric instrument

2019). The resources embedded in these social interactions have been naturally called teachers' social capital (Coburn and Russell, 2008; Baker-Doyle and Yoon, 2011). Until now, most of these studies have focused on teachers interacting with colleagues within their schools but some studies are going beyond and also look at the influence of teacher interactions between different schools (Cheah et al., 2011; Spillane et al., 2015).

Based on the idea that teachers' interactions are beneficial for teacher development, the social capital theoretical lens used in teacher research is strongly rooted in the conceptualization of individual social capital. This is also visible in the increasing use of the social network approach to study teacher development (Baker-Doyle and Yoon, 2020). As individual social capital refers to network-based social capital (Lin, 2008), the social network approach is particularly relevant for its operationalization.

Nevertheless, and this is where the concept becomes fuzzy, some studies in teacher research build their rationale on individual social capital, rooted in the idea that "relationships matter", but theoretically and methodologically use a mixture of individual and collective social capital. Regarding this matter, we argue that even though teacher research becomes increasingly interested in the concept of social capital, its theoretical meaning has sometimes been overlooked. Suffering from its popularity, there is a risk that the concept becomes too general to be meaningful (Li, 2015).

To illustrate this problem, we now present examples of studies in the teacher research domain using strictly either individual social capital or collective social capital. The examples of studies using collective social capital are only illustrative. They do not represent the current trend in teacher research (which is mainly using an individual social capital approach) but illustrate how collective social capital can also be used in teacher research. We then present studies that mix both individual and collective social capital under the umbrella term of social capital, while being strongly rooted in the individual perspective of social capital. Following the criticisms made against Coleman and Nahapiet and Ghoshal in the past, we argue that the mix of these concepts can be conceptually and methodologically problematic. **Table 2** presents the social capital conceptualizations of the examples presented in the next sections.

Individual and Collective Social Capital in Teacher Research

As highlighted in the previous section, the individual social capital conceptualization in the context of teacher research could be synthesized as follows: *Teachers' relationships matter because they represent resources, as a form of capital, for teachers' development.*

An example of a well-known study in the teacher research domain using social capital from an individual perspective is the article of Spillane et al. (2012). In their study, social capital is defined as the advice and information available through relationships with colleagues. Their rationale for using the notion of social capital is that teachers can develop their knowledge "through on-the-job interactions with colleagues" (Spillane et al., 2012, p. 1118). Their study aimed to identify the factors that facilitate the development of teacher social capital. They used a quantitative social network approach (P*2 models, Van Duijn et al., 2004; Veenstra et al., 2007) to highlight factors associated with the occurrence of ties between staff members. Information about ties was obtained through the question "To whom do you turn in this school for advice or information about mathematics/reading/language arts/English instruction". As such, the more a predictor was associated with the existence of ties between staff members, the more it contributed to teacher social capital.

Struyve et al. (2016) is another example of a study in the teacher research domain in which an individual social capital perspective is used. These authors analyzed how teacher social capital can reduce early career teacher attrition. They defined social capital as "the set of resources embedded in social relations" (Struyve et al., 2016, p. 200). They measured social capital as the number of colleagues with whom a teacher has interactions (instrumental interactions: "to whom do you go to for class-related information?"; or expressive interactions: "whom do you go to discuss more personal matters?").

A lot of other studies could have been used as examples: Bristol and Shirrell (2019), Thomas et al. (2019), März and Kelchtermans (2020), and Coppe et al. (2021).

The use of collective social capital is way more uncommon in teacher research. An example of a study in the teacher research domain using social capital from a collective perspective is the article of Belfi et al. (2015). These authors use the concept

of "school-based social capital" firstly developed by Goddard (2003). They measured collective social capital, at the school level, with scale items related mainly to the school's trust climate, commitment climate, and support climate. As another example of a study using collective social capital, van Maele and van Houtte (2011) analyzed to what extent homogeneity in teachers' beliefs about students' ability enhances school collective social capital. Their school collective social capital was measured through the trust in colleagues scale (Hoy and Tschannen-Moran, 2003).

Social Capital as a Mix of Individual and Collective Social Capital

While individual and collective social capital are two different concepts, a lot of studies in the teachers' research mix the two conceptualizations while in the meantime being rooted in the individual social capital perspective.

An example of a study in the teacher research domain mixing individual social capital and collective social capital under the umbrella term social capital is the study of Moolenaar et al. (2014). The article starts by stating that "Social capital theory explains how social relationships enable individuals to have access to and make use of, the resources that reside in their social networks" (Moolenaar et al., 2014, p. 208), referring to an individual perspective of social capital. Social capital, however, is later on in the article operationalized as having two components, namely relationships with colleagues and norms and values shared by group members. The first component is measured through a social network approach with the question "Whom do you turn to in order to discuss your work?" and for the second component a scale measuring trust in colleagues is used (Hoy and Tschannen-Moran, 2003). Moolenaar et al. (2014) hypothesize that social interactions create a trust climate in schools. Here, they describe trust climate as a factor of cooperation. One of their conclusions is that social interactions and trust climate may be in a circular relationship, one influencing the other. In other words, given the umbrella concept "social capital" used in this study, social capital predicts social capital, which is a tautological statement (Woolcock, 2010).

Another study mixing individual and collective social capital is reported in the article of Hopkins et al. (2019). Their study presents the importance of collaborations with colleagues for the retention of beginning teachers. In the article, adopting an individual approach, social capital is defined as "the resources embedded in social networks that can be accessed and used by actors for action" using the definition of Lin (2001, 2008). Then, social capital is seen as consisting of two dimensions, namely social network structure and relational trust (Hopkins et al., 2019). The social network dimension is measured with the question "to whom do you turn for advice or information related to curriculum, teaching, and/or student learning?" Trust is measured using the teacher-teacher trust scale (Tschannen-Moran and Hoy, 1998).

A third study mixing the conceptualization of social capital is the study of Liou et al. (2017). Here, social capital is defined as "the resources embedded in social networks that are formed by social relations" (Liou et al., 2017, p. 636) referring notably to the work of Lin about individual social capital. In the meantime social capital is described as shaped by two dimensions: social network structure and relational trust, referring to the work of Nahapiet and Ghoshal (1998). In addition, relational trust is defined as the "adhesive that connects individual actors" (Liou et al., 2017, p. 638) implying that one of the two dimensions of their social capital construct is an antecedent of the other.

We acknowledge that the studies listed in this section participated significantly to bring and to show the value of the social capital concept in the teacher research and they represent important contributions to the field. However, the approaches of each of these three studies seem to be rooted in Coleman's or Nahapiet and Ghoshal's view of social capital as they talk about social capital from an individual perspective and a collective perspective but in the meantime, anchor their definitions of social capital from an individual perspective. Beyond the idea that individual and collective social capital are sometimes considered as antagonist notions (Rostila, 2011)—inviting researchers to choose their playground well—we believe that mixing different conceptualizations of social capital, without making it clear, is problematic as it makes the concept blurry. Especially, when studies root their rationale in individual social capital (mainly developed in Lin's work), it can be problematic to operationalize part of the concept with variables related to collective social capital. From the individual social capital defender's point of view, as Lin wrote:

> (…) trust has also been employed as a component or an indicator of social capital. However, its "social" nature is uncertain, and conceptually it might be more appropriate to consider it as an antecedent or effect rather than a component of social capital. (…) These discussions do not take away the conceptual significance of trust in its various forms (…). Rather, they remind us that it behooves us to refrain from equating trust with social capital. (Lin, 2008, p. 17).

Also, according to Son:

> Trust is exogenous to (individual) social capital. Trust is an attitude toward people. (Individual) Social capital indicates the volume of instrumental and expressive resources within a network. In extreme cases, social capital can exist regardless of the degree or even the presence or absence of trust as long as there are operational ties. (...) If one understands social capital in a figurative and symbolic way, detached from the concrete resources commonly held by a network of people, one may call trust social capital. (...) Of course, a network-based theory of social capital refutes this idea because trust and norms are not resources in themselves. (Son, 2020, p. 149, 150)

And at the opposite, from the defenders of collective social capital, as Lochner et al. wrote:

> Social capital is a feature of the social structure, not of the individual actors within the social structure: it is an ecologic characteristic. In this way social capital can be distinguished from the concepts of social networks and social support, which are attributes of individuals. (Lochner et al., 1999, p. 260)

Exchanges between teachers represent (individual) social capital as it represents a resource of advice, information, support, and learning. Some could also consider, in a symbolic way, that positive school climates (such as positive norms and trust) represent (collective) social capital as it shapes a positive environment to work and evolve. It is not so easy to believe that resources embedded in interactions and a positive school climate *are* the same notion that is called social capital. We do not argue here that one of the two notions is better than the other, but we believe it is necessary to choose one of the two research traditions to avoid a loss of conceptual meaning: "When social capital shifts from an individual-level relationship to a feature of a community, it becomes conceptually fuzzy" (Tzanakis, 2013). As a matter of fact, the teacher research domain has been more rooted in the individual perspective of social capital (Baker-Doyle, 2012), as this perspective represents precisely the idea that teachers' relationships matter for teachers' development. It does not mean that collective social capital is not something that could be interesting to study in schools. It does mean that scholars should be aware that building a rationale based on the idea that teachers' interactions represent resources for teachers' development is a rationale coming from the individual social capital conceptualization. Consequently, if scholars want to add the concept of collective social capital in their study, it should be carefully argued, and these two social capitals should be distinguished as two different concepts.

MEASUREMENT IN TEACHER RESEARCH

As individual and collective social capital are two different concepts, it is not surprising to see that they are methodologically operationalized in very different ways (see **Table 2**, which illustrates this idea). In this section, we briefly present the most common measures of collective and individual social capital used in research on teachers. Then, we discuss how their mix can be problematic. Finally, we briefly discuss some current and future perspectives to measure individual social capital as teacher research is particularly rooted in this conception.

Implications of Conceptualizations on Measurement

Collective social capital, originally theorized as a climate of civic engagement (Putnam, 2000), is mainly operationalized through a measure of school climate. This climate is sometimes considered as a trust climate among colleagues (van Maele and van Houtte, 2011), or a combination between different types of engagement: trust, commitment, and support between actors within the school (Goddard, 2003). Studies strictly using the concept of collective social capital in teacher research are mainly based on a quantitative design with psychometric surveys to measure collective social capital. We mainly noted the use of the teacher trust climate scale (Tschannen-Moran and Hoy, 1998; Hoy and Tschannen-Moran, 2003) or the school-based social capital scale (Goddard, 2003).

Individual social capital, conceptualized as the resources available through ties in one's network (Lin, 2001) is mainly operationalized with the social network approach. Numerous different social network methods have been used. We will come back later in this section to discuss these different methods. Rarely, individual social capital is measured with non-network scales with items related to support available from colleagues (e.g., Talis, 2018).

Unsurprisingly, studies mixing individual and collective social capital use both the social network approach and a psychometric instrument to measure their umbrella social capital. Mostly, the collective part of their social capital construct is measured with the trust in colleagues or derived scales (Hoy and Tschannen-Moran, 2003) and the individual part of their social capital construct is measured with *centrality measures*, which are social network data operationalizing to what extent an individual has access to others in their social network.

In the same way that collective and individual social capital do not have the same theoretical meaning, trust climate and number of ties with colleagues (which is a commonly used centrality measure: degree centrality) do not represent the same measurement object. Moreover, one can exist with or without the other. Some studies mixing collective and individual social capital analyzed the predictive link between trust and interactions with colleagues and concluded that one predicts the other (Moolenaar et al., 2014). This represents confusion between what *is* social capital and what are the antecedents or consequences of social capital (Tzanakis, 2013). As mentioned previously, it leads to the tautological statement: social capital predicts social capital (Woolcock, 2010). Following Lin and Son, we argue that for studies rooted in individual social capital but mixing individual and collective social capital, trust "is an antecedent or effect rather than a component of social capital" (Lin, 2008, p. 17) and as such, "trust is exogenous to social capital" (Son, 2020, p. 149). Subsequently, trust and interactions with peers cannot represent two parts of the same construct. Although they could represent two different constructs that are similarly named, namely individual and collective social capital but are clearly stated as different. In this way, they could be both present in the same empirical study, for example, by analyzing to what extent school trust climate (as collective social capital) predicts interactions between teachers (as individual social capital) or by testing this relationship in the opposite way since collective and individual social capital are expected to be in cyclic relationships (Moolenaar et al., 2014). In such an effort, there is no mix or risk of confusion between individual and collective social capital. Moreover, testing the relationships between individual and collective social capital properly would also allow to disentangle the effects of each concept.

Besides, we propose an analytical model that could allow to integrate both individual and collective social capital in the same study on the basis of a multilevel analytical framework. As collective social capital is often measured through psychometric scales (e.g., trust climate scale) and individual social capital is mainly measured through a social network approach (e.g., degree centrality), the model must take into account the non-independence of social network observations that is inherent to social network data (Tranmer et al., 2014). To this end, we inform the readers that the multiple membership multiple classification

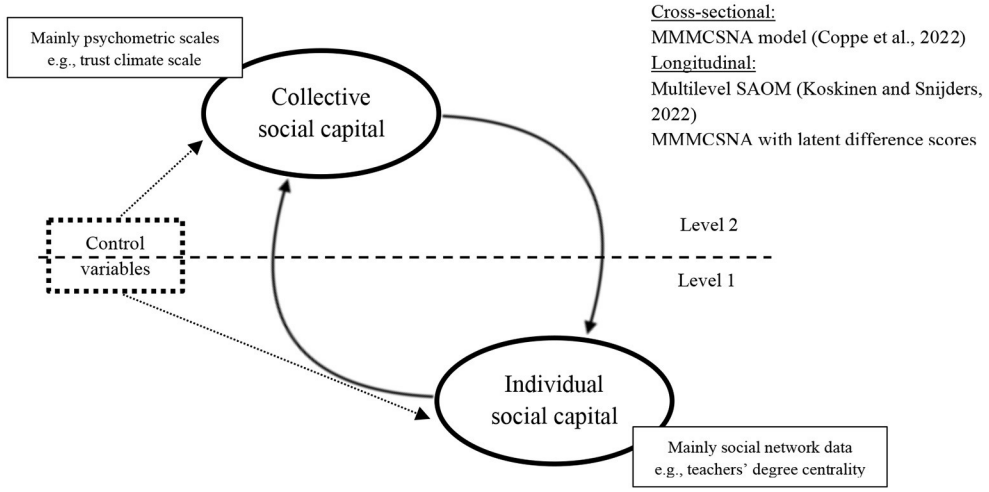


FIGURE 2 | Analytical model for testing the relationship between individual and collective social capital. Outcome variable can be added. Individual or collective social capital would be then considered as mediator between collective/individual social capital and the outcome.

social network model (Tranmer et al., 2014; Coppe et al., 2022) is suitable for cross-sectional data and longitudinal data (implying to work with latent difference scores for longitudinal data) and the multilevel stochastic actor-oriented model is recommended for longitudinal data (Koskinen and Snijders, 2022). More information about these models is available in the above-mentioned references.

Current and Future Prospects About Individual Social Capital Measurement Methods in Teacher Research

In this section, we focus on current and future prospects about individual social capital measurement methods in teacher research instead of discussing the prospects for both individual and collective perspectives because research in the teacher domain is mainly rooted in the individual perspective of social capital, as highlighted earlier in this paper.

Teacher individual social capital is mainly analyzed through the social network approach. It theorizes, represents, and analyzes nodes (actors) and ties (links) between actors within a social structure (the network). The social network approach is "a powerful analytic tool" to understand "the structure and content of teachers' professional relations" (Coburn and Russell, 2008, p. 226) and as such, it represents "an ideal framework for managing the complexity inherent in studying teachers' interactions" (Thomas et al., 2019, p. 134).

Through the social network approach, teacher individual social capital has been mainly measured with centrality measures, which are extracted from the network. Several centrality measures exist but mainly degree centrality (indegree centrality and outdegree centrality) and closeness centrality have been used as proxies for teacher individual social capital. Degree centrality is "the number of alters [other people in the network] that an ego [the focused person in the network] is directly connected to, possibly weighted by strength of tie" (Borgatti et al., 1998, p. 30). Closeness centrality is "the total graph theoretic distance from ego to all others in the network" (often inverted to keep a positive interpretation) (Borgatti et al., 1998, p. 31). Consequently, studies on teachers' individual social capital mainly follow a quantitative design based on analysis about antecedents, consequences, or comparisons in centrality measures (e.g., Struyve et al., 2016; Bristol and Shirrell, 2019; Coppe et al., 2022).

This prevalence of quantitative designs highlights an issue that is present more broadly in the literature on individual social capital. That is, most theories on social capital "exclusively accentuate the positive features of social capital while ignoring its possible downsides (...). Henceforth, theories on social capital should increasingly consider its possible dark side" (Rostila, 2011, p. 2). Indeed, using centrality measures to grasp social capital postulates that the more a teacher has interactions with colleagues, the more they possess social capital (Bristol and Shirrell, 2019). However, some interactions could be an obstacle for teachers' development. Consequently, beyond the use of centrality measures and quantitative designs to analyze teachers' social capital, its antecedent and consequences, it is important to go deeper into the meaning of these interactions. Combining qualitative data such as interviews to have more details about teachers' interactions seems a promising practice to this end (Penuel et al., 2009). This combination is in line with the emerging research tradition calling for mixed methods social network analysis (Froehlich et al., 2020a). Until now, only a few studies about teachers' social capital have used a mixed-method social network analysis approach (e.g., Thomas et al., 2019; Coppe et al., 2021).

CONCLUSION

Considering the growing attention to the concept of "social capital" in studying teacher's professional development, the aim of this paper was to describe and illustrate the use of

this concept in research on teachers. Different definitions and operationalizations are used and this makes "social capital" a blurry concept. Our study revealed that "social capital" is not an umbrella concept and that two main conceptualizations exist in the literature: individual and collective social capital. Up until now, the concept of individual social capital is mostly used in the teacher development literature. However, we found mismatches between definitions and operationalizations of the concept of social capital. A common practice is to use individual social capital as a definition while operationalizing the concept by using a mix of individual and collective social capital measures. This is problematic as it can lead to tautological statements, and as collective and individual social capital can exist both with and without each other. Using a mix of individual and collective social capital under the same umbrella concept of "social capital" has been criticized for a long time (Lin, 2008; Woolcock, 2010; Tzanakis, 2013; Son, 2020). Even those who look favorably upon the conceptual fuzziness of "social capital"—arguing that it has usefully "draw[n] attention to salient features of the social and political world"—argue that this "does not in any way absolve individual users [of the concept] of the requirement to be as precise as possible in articulating their particular definitions, theoretical moorings, and empirical referents" (Woolcock, 2010, p. 470–471). We, therefore, recommend that authors consistently explicate if they use individual and/or collective definitions of social capital, and align their definition with the way they operationalize the concept. In studies that measure both individual and collective social capital, we suggest that authors make the position of each of the main concepts in their theoretical model crystal clear. As suggested by Moolenaar et al. (2014), collective social capital might precede as well as follow from individual social capital, meaning that the two concepts are different. Moreover, it might also be interesting to examine possible interactions between individual and collective social capital, as we proposed in the **Figure 2**.

Concerning the measurement of individual social capital, we encourage researchers to measure not only the quantity of teachers' social interactions. Some interactions could have negative consequences, referring to the dark side of social capital (Rostila, 2011). We need to go beyond the quantity and grasp the quality and the meaning of interactions. A promising avenue to this end is to combine quantitative (quantitative social network approach) and qualitative (qualitative social network approach: Herz and Altissimo, 2021, interviews, and observation) research methods (i.e., mixed methods social network analysis). In this perspective, MMSNA is a promising area (Penuel et al., 2009).

Distinguishing individual and collective social capital and recognizing that individual social capital is at the forefront of teacher research also has implications for teacher education. As individual social capital can exist without collective social capital, it is important that teacher educators raise student teachers' awareness about the importance of building their networks in their future workplace and teach them about how to navigate the social structure of their school. Teacher induction research mainly emphasizes the importance of supportive school cultures for facilitating teacher induction and wellbeing. Nevertheless, novice teachers are agents, who can also actively build up their network and, as such, develop their individual social capital. "The early career teacher as a networker", as written by Kelchtermans (2019), highlights the idea that teachers are not only passive receivers of the school structure (characterized by a positive or negative climate), but that they are also active developers of their individual social capital, through their agency. To conclude this point, we would like to cite März and Kelchtermans (2020): "(...) it is important to help early-career teachers to become more self-initiated and intentional in their networking (...). In order to be able to network, they need to understand how to navigate within the different networks, and they must be able to read the cultural and political scripts of their school's organization" (p. 9).

Even if we argue that individual capital can exist without collective social capital, it does not mean that collective social capital should be forgotten in teacher education. As proposed by Moolenaar et al. (2014) and illustrated in **Figure 2**, collective social capital can precede individual social capital. As such, raising the awareness of student teachers about the importance of building a trust climate and a sense of belonging (among other forms of collective social capital) is crucial. As such, while this paper mainly emphasized individual social capital in teacher research, we are also convinced that more research analyzing the conditions to foster schools' collective social capital would be valuable. Since collective development and organizational learning are becoming increasingly important for school development, studies on schools' collective social capital could nourish this field of research by emphasizing the organizational conditions that facilitate these collective dynamics.

Finally, in this paper, we did not address the distinction between bridging and bonding social capital—which was introduced mainly by Putman and then reused by individual social capital scholars. Nevertheless, as schools tend to be organized following departmentalized organizational logics, shaping disconnected subgroups of teachers (de Lima, 2007; Coppe et al., 2021), exploring the difference between within-group/department and between-groups/departments' social capital would be interesting.

AUTHOR CONTRIBUTIONS

TC: conceived the original idea, conceptualization, writing—original draft, and funding. LT: conceptualization, writing—original draft, and writing—review and editing. NP: conceptualization and writing—review and editing. DF: writing—review and editing and funding. MS: writing—review and editing. IR: writing—original draft (discussion section), writing—review and editing, funding, and supervision. All authors contributed to the article and approved the submitted version.

FUNDING

This work was supported by the F.R.S.-FNRS: Belgian fund for scientific research. Grant Number: [F 6/40/5 - FRESH/FC 29830].

REFERENCES

Baker-Doyle, K. J. (2012). First-year teachers' support networks: intentional professional networks and diverse professional allies. *New Educator* 8, 65–85. doi: 10.1080/1547688X.2012.641870

Baker-Doyle, K. J., and Yoon, S. A. (2011). In search of practitioner-based social capital: a social network analysis tool for understanding and facilitating teacher collaboration in a US-based STEM professional development program. *Prof. Dev. Educ.* 37, 75–93. doi: 10.1080/19415257.2010.494450

Baker-Doyle, K. J., and Yoon, S. A. (2020). The social side of teacher education: implications of social network research for the design of professional development. *Int. J. Educ. Res.* 101, 101563. doi: 10.1016/j.ijer.2020.101563

Belfi, B., Gielen, S., De Fraine, B., Verschueren, K., and Meredith, C. (2015). School-based social capital: the missing link between schools' socioeconomic composition and collective teacher efficacy. *Teach. Teach. Educ.* 45, 33–44. doi: 10.1016/j.tate.2014.09.001

Borgatti, S. P., Jones, C., and Everett, M. G. (1998). Network measures of social capital. *Connections* 21, 27–36.

Bourdieu, P. (1980). Le capital social [Social capital]. *Actes de La Recherche En Sciences Sociales* 31, 2–3. doi: 10.3406/arss.1979.2654

Bristol, T. J., and Shirrell, M. (2019). Who is here to help me? The work-related social networks of staff of color in two mid-sized districts. *Am. Educ. Res. J.* 56, 868–898. doi: 10.3102/0002831218804806

Cheah, C., Ying, Y., Daud, S., Ting, I., and Kiong, W. (2011). A comparative view on the influence of social capital, role of teacher and principal leadership. *Int. Conf. Social. Econ. Dev. IPEDR.* 10, 303–307.

Claridge, T. (2004). *Social Capital and Natural Resource Management: An Important Role for Social Capital?* (Unpublished Thesis), University of Queensland, Brisbane, Australia.

Claridge, T. (2018). Dimensions of social capital - structural, cognitive, and relational. *Soc. Capit. Res.* 12, 1–4. doi: 10.21202/1993-047x.12.2018.3.553-568

Coburn, C. E., and Russell, J. L. (2008). District policy and teachers' social networks. *Educ. Evaluat. Policy Anal.* 30, 203–235. doi: 10.3102/0162373708321829

Coleman, J. S. (1988). Social capital in the creation of human capital. *Am. J. Sociol.* 94, 95–120. doi: 10.1086/228943

Coppe, T., März, V., and Raemdonck, I. (2021). *Becoming a Second Career Teachers in TVET: A Mixed-Method Social Network Perspective*. UCLouvain. [Unpublished].

Coppe, T., Sarazin, M., März, V., Dupriez, V., and Raemdonck, I. (2022). *(Second Career) Teachers' Work Socialization as a Networked Process: New Empirical and Methodological Insights*. Teaching and Teacher Education.

Daly, A. (2010). *Social Network Theory and Educational Change*. Cambridge, MA: Harvard Education Press.

Daly, A. J., Liou, Y. H., and Bjorklund, P. (2018). "Pay, position, and partnership: exploring capital resources among a school district leadership team," in *Network Science in Education*, eds C. Cramer, M. Porter, H. Sayama, L. Sheetz, and S. Uzzo (Cham: Springer). doi: 10.1007/978-3-319-77237-0_8

Daly, A. J., Liou, Y. H., and Der-Martirosian, C. (2020). A capital idea: exploring the relationship between human and social capital and student achievement in schools. *J. Prof. Capital Commun.* 6, 7–28. doi: 10.1108/JPCC-10-2020-0082

de Lima, J. Á. (2007). Teachers' professional development in departmentalised, loosely coupled organisations: Lessons for school improvement from a case study of two curriculum departments. *School Effect. School Improv.* 18, 273–301. doi: 10.1080/09243450701434156

Demir, E. K. (2021). The role of social capital for teacher professional learning and student achievement: A systematic literature review. *Educ. Res. Rev*. 33:100391. doi: 10.1016/j.edurev.2021.100391

Dika, S. L., and Singh, K. (2002). Applications of social capital in educational literature: a critical synthesis. *Rev. Educ. Res.* 72, 31–60. doi: 10.3102/00346543072001031

Edinger, S. K., and Edinger, M. J. (2018). Improving teacher job satisfaction: the roles of social capital, teacher efficacy, and support. *J. Psychol. Interdiscip. Appl.* 152, 573–593. doi: 10.1080/00223980.2018.1489364

Farr, J. (2004). Social capital. A conceptual history. *Polit. Theory* 32, 6–33. doi: 10.1177/0090591703254978

Fine, B. (2010). *Theories of Social Capital: Researchers Behaving Badly, Political Economy and Development*. London: Pluto Press. Available online at: http://library.oapen.org/handle/20.500.12657/30775 (accessed March 05, 2022).

Froehlich, D. E., Mejeh, M., Galey, S., and Schoonenboom, J. (2020a). "Integrating units of analysis: Applying mixed methods social network analysis," in M*ixed Methods Social Network Analysis: Theories and Methodologies in Learning and Education*, eds D. E. Froehlich, M. Rehm, and B. C. Rienties (London: Routledge), 38–48.

Froehlich, D. E., Van Waes, S., and Schäfer, H. (2020b). Linking quantitative and qualitative network approaches: a review of mixed methods social network analysis in education research. *Rev. Res. Educ.* 44, 244–268. doi: 10.3102/0091732X20903311

Gittell, R., and Vidal, A. (1998). *Community Organizing: Building Social Capital as a Development Strategy*. New York, NY: Sage Publications.

Goddard, R. D. (2003). Relational networks, social trust, and norms: a social capital perspective on students' chances of academic success. *Educ. Eval. Policy Anal.* 25, 59–74. doi: 10.3102/01623737025001059

Godechot, O., and Mariot, N. (2004). Les deux formes du capital social [The two forms of social capital]. *Revue française de sociologie* 45, 243–282. doi: 10.2307/3323157

Guiso, L., Paola, S., and Luigi, Z. (2011). "Civic capital as the missing link," in *Social Economics Handbook*, eds J. Benhabib, A. Bisin, and M. O. Jackson (Amsterdam: Elsevier), 417–480.

Hargreaves, A., and Fullan, M. (2012). *Professional Capital: Transforming Teaching in Every School*. New York, NY: Teachers College Press.

Herz, A., and Altissimo, A. (2021). Understanding the structures of transnational youth im/mobility: a qualitative network analysis. *Global Networks* 21, 500–512. doi: 10.1111/glob.12315

Hopkins, M., Bjorklund, P., and Spillane, J. P. (2019). The social side of teacher turnover: closeness and trust among general and special education teachers in the United States. *Int. J. Educ. Res.* 98, 292–302. doi: 10.1016/j.ijer.2019.08.020

Hoy, W. K., and Tschannen-Moran, M. (2003). "The conceptualisation and measurement of faculty trust in schools: the Omnibus T-Scale," in *Studies in Leading and Organizing Schools*, eds W. K. Hoy, and C. G. Miskel (Greenwich, CT: Information Age Publishing), 181–208.

Kelchtermans, G. (2019). "Early career teachers and their need for support: thinking again," in *Attracting and Keeping the Best Teachers: Issues and Opportunities*, eds A. Sullivan, B. Johnson, and M. Simons (Singapore: Springer), 83–98.

Koskinen, J., and Snijders, T. A. (2022). Multilevel longitudinal analysis of social networks. *arXiv preprint arXiv:*2201.12713. doi: 10.48550/arXiv.2201.12713

Kyndt, E., Gijbels, D., Grosemans, I., and Donche, V. (2016). Teachers' everyday professional development: mapping informal learning activities, antecedents, and learning outcomes. *Rev. Educ. Res.* 86, 1111–1150. doi: 10.3102/0034654315627864

Leonard, M. (2004). Bonding and bridging social capital: reflections from belfast. *Sociology* 38, 927–944. doi: 10.1177/0038038504047176

Li, Y. (2015). "Social capital in sociological research: conceptual rigour and empirical application," in *The Handbook of Research Methods and Applications on Social Capital*, ed Y. Li (Cheltenham: Edward Elgar Publishing), 1–20.

Lin, N. (2001). *Social Capital: A Theory of Social Structure and Action*. Cambridge: Cambridge University Press.

Lin, N. (2008). "A network theory of social capital," in *The Handbook of Social Capital*, eds D. Castiglione, J. W. van Deth, and G. Wolleb (New York: Oxford University Press), 50–69.

Liou, Y. H., Daly, A. J., Canrinus, E. T., Forbes, C. A., Moolenaar, N. M., Cornelissen, F., et al. (2017). Mapping the social side of pre-service teachers: connecting closeness, trust, and efficacy with performance. *Teach. Teach. Theory Pract.* 23, 635–657. doi: 10.1080/13540602.2016.1218329

Lochner, K., Kawachi, I., and Kennedy, B. P. (1999). Social capital: a guide to its measurement. *Health Place* 5, 1181–1188. doi: 10.1016/S1353-8292(99)00016-7

Marrero, A. (2006). "A re-examination of social capital: The odyssey of a critical concept," in *Paper presenter at the International Sociological Association at Durban*.

März, V., and Kelchtermans, G. (2020). The networking teacher in action: a qualitative analysis of early career teachers' induction process. *Teach. Teach. Educ.* 87, 102933. doi: 10.1016/j.tate.2019.102933

Moolenaar, N. M. (2012). A social network perspective on teacher collaboration in schools: theory, methodology, and applications. *Am. J. Educ.* 119, 7–39. doi: 10.1086/667715

Moolenaar, N. M., Karsten, S., Sleegers, P. J., and Daly, A. J. (2014). "Linking social networks and trust at multiple levels: Examining Dutch elementary schools," in *Trust and School Life*, eds D. Van Maele, P. Firsyth, and M. Van Houtte (Dordrecht: Springer), 207–228.

Nahapiet, J., and Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Acad. Manage. Rev.* 23, 242–266. doi: 10.5465/amr.1998.533225

Paccagnella, M., and Sestito, P. (2014). School cheating and social capital. *Educ. Econ.* 22, 367–388. doi: 10.1080/09645292.2014.904277

Penuel, W., Riel, M., Krause, A., and Frank, K. (2009). Analyzing teachers' professional interactions in a school as social capital: A social network approach. *Teach. Coll. Record.* 111, 124–163.

Ponthieux, S. (2006). *Le Capital Social*. Paris: Éditions La Découverte, Collection Repères.

Poortinga, W. (2006). Social capital: an individual or collective resource for health? *Soc. Sci. Med.* 62, 292–302. doi: 10.1016/j.socscimed.2005.06.008

Portes, A. (1998). Social capital: its origins and applications in modern sociology. *Annu. Rev. Sociol.* 24, 1–24. doi: 10.1146/annurev.soc.24.1.1

Putnam, R. (1994). Social capital and public affairs. *Bull. Am. Acad. Arts Sci.* 47, 5–19. doi: 10.2307/3824796

Putnam, R. (2001). Social capital: measurement and consequences. *Can. J. Policy Res.* 2, 41–51.

Putnam, R. D. (2000). "Bowling alone: America's declining social capital," in *Culture and Politics*, eds L. Crothers and C. Lockhart (New York, NY: Palgrave Macmillan), 223–234.

Rostila, M. (2011). The facets of social capital. *J. Theory Soc. Behav.* 41, 308–326. doi: 10.1111/j.1468-5914.2010.00454.x

Son, J. (2020). *Social Capital*. Cambridge: Polity Press.

Spillane, J. P., Hopkins, M., and Sweet, T. M. (2015). Intra-and interschool interactions about instruction: exploring the conditions for social capital development. *Am. J. Educ.* 122, 71–110. doi: 10.1086/683292

Spillane, J. P., Kim, C. M., and Frank, K. A. (2012). Instructional advice and information providing and receiving behavior in elementary schools: exploring tie formation as a building block in social capital development. *Am. Educ. Res. J.* 49, 1112–1145. doi: 10.3102/0002831212459339

Struyve, C., Daly, A., Vandecandelaere, M., Meredith, C., Hannes, K., and De Fraine, B. (2016). More than a mentor. *J. Prof. Capital Community* 1, 198–218. doi: 10.1108/JPCC-01-2016-0002

Talis. (2018). *TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners, TALIS, Éditions*. Paris: OCDE. doi: 10.1787/1d0bc92a-en

Thomas, L., Tuytens, M., Devos, G., Kelchtermans, G., and Vanderlinde, R. (2019). Beginning teachers' professional support: a mixed methods social network study. *Teach. Teach. Educ.* 83, 134–147. doi: 10.1016/j.tate.2019.04.008

Tlili, A., and Obsiye, M. (2014). What is Coleman's social capital the name of? A critique of a not very social capital. *Crit. Sociol.* 40, 551–574. doi: 10.1177/0896920513479615

Tranmer, M., Steel, D., and Browne, W. J. (2014). Multiple-membership multiple-classification models for social network and group dependences. *J. R. Stat. Soc. Series A* 177, 439–455. doi: 10.1111/rssa.12021

Tschannen-Moran, M., and Hoy, A. W. (1998). Trust in school: a conceptual and empirical analysis. *J. Educ. Adm.* 36, 334–352. doi: 10.1108/09578239810211518

Tzanakis, B. M. (2013). Social capital in Bourdieu's, Coleman's and Putnam's theory: empirical evidence and emergent measurement issues. *Educate* 13, 2–23.

Van Duijn, M. A. J., Snijders, T. A. B., and Zijlstra, B. J. H. (2004). p2: a random effects model with covariates for directed graphs. *Stat. Neerl.* 58, 234–254. doi: 10.1046/j.0039-0402.2003.00258.x

van Maele, D., and van Houtte, M. (2011). Collegial trust and the organizational context of the teacher workplace: the role of a homogeneous teachability culture. *Am. J. Educ.* 117, 437–464. doi: 10.1086/660754

Veenstra, R., Lindenberg, S., Zijlstra, B. J., De Winter, A. F., Verhulst, F. C., and Ormel, J. (2007). The dyadic nature of bullying and victimization: testing a dual-perspective theory. *Child Dev.* 78, 1843–1854. doi: 10.1111/j.1467-8624.2007.01102.x

Woolcock, M. (2010). The rise and routinization of social capital, 1988-2008. *Annu. Rev. Polit. Sci.* 13, 69–87. doi: 10.1146/annurev.polisci.031108.094151

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Copyright © 2022 Coppe, Thomas, Pantić, Froehlich, Sarazin and Raemdonck. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 19 July 2022
DOI 10.3389/fpsyg.2022.885616

Check for updates

OPEN ACCESS

EDITED BY
Simon Beausaert,
Maastricht University, Netherlands

REVIEWED BY
Maedeh Aboutalebi Karkavandi,
Swinburne University of Technology, Australia
Thibault Coppe,
Catholic University of Louvain, Belgium

*CORRESPONDENCE
Beat Rechsteiner
beat.rechsteiner@ife.uzh.ch

SPECIALTY SECTION
This article was submitted to Organizational Psychology, a section of the journal Frontiers in Psychology

RECEIVED 28 February 2022
ACCEPTED 29 June 2022
PUBLISHED 19 July 2022

CITATION
Rechsteiner B, Compagnoni M, Maag Merki K and Wullschleger A (2022) "Title does not dictate behavior": Associations of formal, structural, and behavioral brokerage with school staff members' professional well-being.
Front. Psychol. 13:885616.
doi: 10.3389/fpsyg.2022.885616

COPYRIGHT
© 2022 Rechsteiner, Compagnoni, Maag Merki and Wullschleger. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

"Title does not dictate behavior": Associations of formal, structural, and behavioral brokerage with school staff members' professional well-being

Beat Rechsteiner*, Miriam Compagnoni, Katharina Maag Merki and Andrea Wullschleger

Institute of Education, Faculty of Arts and Social Sciences, University of Zurich, Zurich, Switzerland

Individuals in brokerage positions are vital when further developing complex organizations with multiple subgroups only loosely coupled to each other. Network theorists have conceptualized an individual's brokerage as the degree to which a person occupies a bridging position between disconnected others. Research outside the school context has indicated for quite some time that an individual's social capital in the form of brokerage is positively associated with professional development—not only on a collective but also on an individual level. Schools are without any doubt complex organizations with multiple loosely connected stakeholders involved when further developing their educational practice. Thus, it is not surprising that in recent years, the concept of brokerage has gained interest in research on school improvement as well. Up to now, in school improvement research brokerage has been operationalized in different ways: as individuals' formal entitlement to act as intermediaries (formal brokerage), their position within a social network (structural brokerage), or their behavior when linking disconnected groups of staff members (behavioral brokerage). As these perspectives have often been examined separately, this study, as a first step, aimed to simultaneously assess school staff members' formal, structural, and behavioral brokerage, and examine their degree of interrelatedness. In a second step, associations of brokerage with professional well-being were analyzed. Even though there is evidence for the positive impact of brokerage on professional development, only little is known about its associations with professional well-being. In a third step, interaction effects were examined when formal brokerage is congruent or incongruent with other facets of brokerage. Based on a sample of 1,316 school staff members at 51 primary schools in the German-speaking part of Switzerland, we conducted both bivariate correlational and multiple-group structural equation modeling analyses. The findings revealed that formal, structural, and behavioral brokerage are interrelated facets. However, formal entitlement did not determine either

structural position or behavior. Moreover, brokerage within schools was only partially related to professional well-being. In the discussion section, the study's key contributions and practical implications are presented in detail.

KEYWORDS

brokerage, principals, teachers, professional development, social capital, professional well-being

Introduction

Previous research outside of educational science has indicated that an individual's social capital in the form of brokerage is related to professional development—both collectively and individually (i.e., Burt, 2005; Ward et al., 2009; Meyer, 2010; Stovel and Shaw, 2012; Long et al., 2013; Obstfeld et al., 2014; Kwon et al., 2020). Brokerage can be conceptualized as the complex processes when individuals occupy a bridging position between disconnected others and facilitate interactions among them (Halevy et al., 2019). This bridge-building may function as an "engine of endogenous change" (Burt, 2005), as being in an intermediary position allows brokers to gain a different perspective on their own everyday practice by seeing what others do, learning what others know (or don't know), and realizing what others struggle with. In this way, their everyday practice may appear in a new light, making their own strengths and weaknesses more visible. This may then function as a stimulus for further developing and adjusting their own practice and routines.

In the last decade, a growing number of studies in research on school improvement have focused explicitly on brokerage (i.e., Spillane and Kim, 2012; Daly et al., 2014b; Neal et al., 2019; Van Gasse et al., 2019; van den Boom-Muilenburg et al., 2022). This is not surprising, as there is a long tradition of theoretically framing educational systems as complex landscapes in which various actors within, between, and beyond schools constantly work the interface between loosely coupled subsystems (Weick, 1976; Shen et al., 2017)—such as different classrooms and departments within a school, different schools within a local school district, or school districts within a regional or national school system. The overarching aim in studies on brokerage in the domain of school improvement is to better understand both formal and informal activities when bringing disconnected groups within the school context together. This may be in terms of how knowledge is transferred from research to practice (Cooper, 2012; Brown, 2019; Neal et al., 2019), from school district to school (Park and Datnow, 2009; Daly et al., 2014a,b), from school to school (Kolleck, 2016), or within schools (Slavit and Roth McDuffie, 2013; Jusinski, 2019; van den Boom-Muilenburg et al., 2022).

In this current study, we narrowed our focus on the loose coupling of different departments and subgroups within schools. Previous research indicated that schools are often organized in multiple departments and subgroups not necessarily aligned in terms of the direction they take when further developing their educational practice and often function autonomously rather than in an orchestrated way (Feldhoff et al., 2010; Farley-Ripple and Grajeda, 2019). We argue that the brokerage concept is essential to analyze how disconnected subgroups within a school may be linked when striving for effective collaboration to change educational practice (i.e., Carmichael et al., 2006; Spillane and Kim, 2012; Nordholm, 2016).

However, there are still multiple shortcomings of the brokerage concept when it comes to school improvement research and in particular concerning school staff members as bridge-builders within their schools' professional networks.

First, brokerage is a multifaceted phenomenon rather than a unidimensional concept (Long et al., 2013). Hence, brokerage has been examined not from a single but from multiple angles (Stovel and Shaw, 2012; Kwon et al., 2020). In previous research, formal, structural, and behavioral perspectives to assess an individual's brokerage can be differentiated. These perspectives all share commonalities conceptually but stem from different research traditions—for instance, in terms of the underlying theoretical assumptions or the methodological approaches to identifying brokerage. However, up to now these perspectives have often been examined separately and the relationships between these different aspects of brokerage have not been considered sufficiently in empirical research on school improvement. It is therefore not clear to what degree these different aspects of brokerage deliver information that may be used either interchangeably or as complementary. Accordingly, the first aim of this study was to examine to what degree individual teachers' titles (being appointed to act as a formal teacher leader) are related to their structural positions (bridging structural holes in a network), and whether the formal title or structural position dictates teachers' network behavior (acting as bridge-builders between different groups of actors).

Second, whereas there is ample evidence that being in a brokerage position brings advantages for professional development, there is only little research on the associations

of brokerage with professional well-being. However, a high level of professional well-being has proven to be of crucial importance when changing a school's educational practice (Creemers and Reezigt, 1996). The few studies beyond the school context that examined these relationships are rather inconsistent and highly dependent on the aspect of an individual's professional well-being that was assessed. Burt (1992, 2005), for instance, proclaimed that brokers not only do better in terms of professional development but also feel more powerful and successful when negotiating agreements and experience themselves as more competent professionally. Other researchers found that being in between different groups may also have harmful consequences on an individual's psychological well-being (i.e., Krackhardt, 1999; Wenger, 1999; Carboni and Gilman, 2012; Mollenhorst et al., 2015). The argumentation is that being simultaneously part of multiple groups is often stressful and full of challenges. However, the associations of brokerage and professional well-being have not yet been studied thoroughly in the school context. This is a major concern, as brokerage is highly context-specific (Kwon et al., 2020). Building bridges among disconnected others in schools, and in particular school staff members the closest to the classroom, such as teachers and principals, differ from other organizations and their employees—for instance, in terms of organizational (leadership) structures, career paths, and available incentives to foster more organizational commitment (Lortie, 1975; Ingersoll and Collins, 2018). Hence, the second aim of this study was to explore the relationships between school staff members in a brokerage position and their professional well-being in a multifaceted way. To this end, professional well-being was conceptualized by three overlapping themes that represent both *hedonic* and *eudaimonic* approaches to assessing an individual's professional well-being (Deci and Ryan, 2008): work-related stress, the experience of competency in further developing educational practice, and job satisfaction. Whereas a low level of work-related stress represents the absence of negative affect (*hedonic well-being*), having a meaningful professional life (*eudaimonic well-being*) was assessed through an individual's experience of competency in further developing the school's educational practice. Finally, the third theme, an individual's job satisfaction, overlaps these two traditions, as it stands for a more general evaluation of individuals' professional well-being combining both the absence of negative affect and having a meaningful job.

Third, some studies in school improvement research found that a lack of legitimacy (e.g., not having a formalized brokerage position) is a constraining factor in the benefits of brokerage—both on an individual and collective level (Hopkins et al., 2013; Nordholm, 2016). It therefore seems vital to formalize school actors' brokerage, for instance in the form of middle or teacher leadership groups (Grootenboer et al., 2019), to leverage the potential of brokerage when further developing educational practice (Spillane et al., 2018). However, another study in the domain of school improvement warned about formalizing brokerage by implementing new hierarchical structures (Jusinski, 2019). These structures may threaten teachers' "autonomy parity pattern" (Lortie, 1975)—whereby teachers want autonomy for their work, do not accept interference by outsiders, and demand equal treatment of all teachers (Rowan, 1994; Feldhoff et al., 2010). As a consequence, by formalizing school actors' brokerage their credibility among their peers may decline (Jusinski, 2019). To analyze this inconsistency in previous research, we examine an interactional effect when formal brokerage is congruent or incongruent with other facets of brokerage on the outcome variables of professional well-being.

Bringing these three concerns together, the overarching aims of this article are to analyze brokerage and professional well-being in a more comprehensive way and to investigate the relation of brokerage to school staff members' professional well-being. To this end, we examined primary schools in the German-speaking part of Switzerland, where school staff members often organize in subject-related departments or *Zyklusteams* (which can be translated as a team of teachers based on the students' age group, such as lower and upper primary classes) (Eurydice, 2022).

In the following sections, we first provide a more in-depth picture of the multifaceted concepts of brokerage and professional well-being. We then theoretically frame and empirically report how the two concepts of brokerage and professional well-being may correspond with each other. Based on that, we then outline our research questions and hypotheses.

Brokerage: A multifaceted concept

Hargreaves and Fullan (2015) indicated that school staff members' professional development is influenced both by an individual's human and social capital. Whereas human capital can be conceptualized as individuals' pedagogical and work-related knowledge and their strategies how to increase this knowledge (Mitchell and Sackney, 2011) a school staff member's social capital is about their social relationships within and beyond their school (Hargreaves and Fullan, 2015). In previous research social capital has been conceptualized and used in different ways. It is beyond the scope of this publication to give an overview of all these different conceptualizations. However, Coppe et al. (2022) provide a critical reflection in this special issue on the use of social capital in teacher research both in terms of theoretical assumptions and methodological approaches. They pointed out that studies using social capital as a theoretical lens need to clearly define what kind of social capital they are referring to—for instance, whether the focus is on an individual or collective level. In this study, we refer to the work of Crossley et al. (2015) to conceptualize an individual's social capital as brokerage. Crossley et al. (2015) distinguished three

different versions of social capital: "one focused upon access to resources; one focused upon social cohesion; and one focused upon 'brokerage' across 'structural holes'" (p. 26). In contrast to social capital as resources or cohesion the brokerage version of social capital has an explicit focus on change processes and how individuals may foster or constrain professional development (for an overview see Crossley et al., 2015). Previous scholars defined social capital in the form of brokerage as the degree to which individuals act as in-betweens that facilitate "transactions between other actors lacking access or trust in one another" (Marsden, 1982). The definition of brokerage is widely accepted, but the concept has been analyzed from different angles—from a formal, structural, and behavioral perspective.

From a formal perspective, principals and teacher leaders may act as brokers by coordinating the flow of information across different subgroups within an organization (Feldhoff et al., 2010; Wenner and Campbell, 2017). Following the formal approach to brokerage by Gould and Fernandez (1989), school staff members in a brokerage position may function as *gatekeepers* and *representatives* at the same time. As gatekeepers they filter information from outside to their inner circle. As representatives they inform others what issues a specific group is dealing with at the moment. Hence, they can be viewed as bottlenecks that have the mandate to manage both top-down (i.e., school to an individual staff member) and bottom-up (i.e., individual or sub-team to school) change processes.

In the context of school organizations and their development, *steering groups* are an example of and a particular kind of a formal leadership group that is in a brokerage position (Feldhoff et al., 2010; Tulowitzki et al., 2021). Steering groups are a composite of the school's principal and teacher leaders. The steering group members function as intermediaries between school staff and the school's leadership group. In a best-case scenario, they act as bridge-builders that balance the needs and interests of the subgroup they are representing and the needs and interests of the school's leadership group. In their brokerage position they may act as formal gatekeepers, supporting the implementation of school-wide change processes from the center to the utmost periphery of the organization. In reality, however, steering groups are also an "area of tension" (Feldhoff et al., 2010). This is due to the fact that a shift in school staff members' identity from *primus inter pares* [first among equals] to a more managerial role can lead to a fundamental reinterpretation of school leadership, internal hierarchies, and professional roles (Peetz, 2015) as well as to a more aligned educational practice (Scheerens, 2012). For instance, teachers may worry that more collective sensemaking processes to define common goals of school improvement and negotiating a consensus threatens their own agenda or vision of how to improve educational practice (Vangrieken et al., 2017). Thus, some school actors may see the implementation of such new cooperative structures as a loss of their autonomy (Vangrieken and Kyndt, 2020). Therefore, a teacher being formally appointed (for instance by the principal) to act as a broker between internal subgroups and the school's leadership group may be more or less accepted by colleagues (Hopkins et al., 2013; Nordholm, 2016), which may lead to more stress for the teacher and reduced perceived benefit of the brokerage position. As a consequence, school staff members may reject or look critically at these formal middle management structures.

From a structural perspective, brokerage is analyzed in terms of network structures. Brokers differ from other actors in a social network by bridging structural holes between disconnected individuals; they therefore have opportunities to link people but also to control the flow of information (Burt, 1992; Wasserman and Faust, 1994). A structural hole occurs in a social network when two actors are not directly connected. According to Burt (2005), an individual's social capital is a function of brokerage across these structural holes. Hence, social capital is determined not only by formal roles but also by informal ties between actors. It is therefore vital to analyze structural brokerage based on social network analysis when examining dynamics in both formal and informal cooperative structures (Burt, 2005). The most straightforward way to measure an individual's degree of being in a brokerage position is the betweenness-centrality (Freeman, 1977). This coefficient is a standardized number of paths going through an individual actor when connecting every other actor in the network on its shortest path. Within a school's social network, an individual with a high betweenness-centrality is perceived by others to be located in-between different subgroups of staff members and this way potentially acts as knowledge manager, capacity builder, and linking agent within the web of a school's actors (Ward et al., 2009).

Up to now, only a few studies have focused on school staff members in structural brokerage positions. However, Daly and colleagues examined cooperative practice among educational leaders on a school and system level (Daly et al., 2014a,b). They indicated that although district leaders are well-positioned in terms of their formal entitlements to act as brokers, they often do not exploit their potentials. Additionally, they pointed out that it is foremost principals as informal and formal brokers, identified based on social network data, who play a vital role in school-to-school cooperation. Further, Hopkins et al. (2013) examined structural brokerage to compare formal and informal network structures when redesigning educational infrastructure on a district level. They found that teacher leaders emerged as essential brokers that help to craft coherence in visions and goals of educational change across different groups of actors within and outside of school. Moreover, in a mixed-method study examining school actors' structural brokerage, Spillane and Kim (2012) found that formal organizational structures have a substantial influence on informal network structures. They pointed out that school organizations embracing a more distributed leadership approach enabled highly credible staff members to act as brokers from a legitimate position. All of these studies put an emphasis on analyzing dynamics

between formal and structural brokerage. They all agreed that formal entitlement does not determine but rather influences an individual's structural network position.

However, Obstfeld et al. (2014) argued, *from a behavioral perspective*, that simply being in a brokerage position does not necessarily lead to actual brokerage behavior. Rather than treating social network structure as a determinant of whether an actor is able to act as a broker, they argued that although network structures affect the ways a broker acts, they do not define brokerage behavior. They conceptualized brokerage as a "behavior by which an actor influences, manages, or facilitates interactions between other actors" (Obstfeld et al., 2014). They pointed out that brokerage behavior may appear in different forms: as a *conduit*, *tertius gaudens*, or *tertius iungens*. Whereas *conduits* ("the third who transfers") facilitate knowledge transfer by acting as neutral messengers, brokers with a *tertius gaudens* orientation ("the third who enjoys") take advantage of their prominent position, for instance by cultivating conflict between individuals or keeping other actors separate. In this way, brokers make sure that they stay in their exclusive and powerful positions, transferring, hoarding, or even manipulating information as it pleases their situation. Previous studies discussed these power dynamics and problematic aspects of brokerage activity (McGrath and Krackhardt, 2003; Burt, 2005; Kislov et al., 2017). In contrast, brokers with a *tertius iungens* orientation ("the third who joins") foster collaboration among others, by introducing different persons to each other and coordinating new collaborative action. Obstfeld et al. (2014) pointed out that organizational change benefits the most when central actors show a *tertius iungens* orientation. Moreover, in this study we refer to school staff members as crucial agents of change actively shaping their professional networks in such a way that collaboration among all staff members is increased and the school's educational practice is improved both sustainably and collectively (Mitchell and Sackney, 2011). Therefore, in the following we refer to the *tertius iungens* orientation only when using the term brokerage behavior.

The behavioral brokerage perspective has so far been rather neglected when it comes to research on school staff members. Moolenaar et al. (2014), as an exception, revealed that school staff members "who are more intentional about brokering connections between others, also tend to share new ideas with more others and in turn perceive their school's climate to be more innovative" (p. 116). Moreover, a study examining teacher involvement in school improvement based on brokerage behavior (Rechsteiner et al., 2022) found that teachers' brokerage behavior is related to their perception of the school's leadership practice and has a positive association with their involvement in further developing the school's educational practice. However, little is known up to now on how school staff members' behavioral brokerage corresponds with the other facets of brokerage outlined above.

Moreover, previous research has neglected to analyze the relation between the formal, structural, and behavioral facets of brokerage. Different combinations of these facets are imaginable, as in the following examples:

- Someone is formally appointed to act as a broker, is actually seen by colleagues as a broker, and actively applies brokerage strategies.
- Someone is only formally appointed, is not accepted by others, and does not show any brokerage behavior.
- Someone acts as a broker, is structurally visible in the school's professional network, but is not formally appointed to act as a broker

In terms of these multiple facets of brokerage, in this study our research questions address to what degree formal, structural, and behavioral brokerage correspond, and whether they function as complements.

In sum, based on previous research we assume that the different facets of brokerage cannot be used interchangeably (i.e., Obstfeld, 2005; Daly et al., 2014a,b). However, we further argue that formal entitlement, structural position, and bridge-building behavior are interrelated and function as complements. In the following section we elaborate on the intertwined nature of these three facets when focusing on brokerage and its relation to professional well-being.

School staff members' professional well-being

Previous research highlighted the importance of school staff members' professional well-being for individual and collective professional development (i.e., Hascher, 2010; Bermejo-Toro et al., 2016; Turner and Thielking, 2019; Hascher and Waber, 2021; Pöysä et al., 2022). School staff members that feel well at work are more committed to taking an active part in school improvement (Creemers and Reezigt, 1996). Moreover, in a systematic review on teacher well-being, Hascher and Waber (2021) pointed out that teachers reporting high professional well-being show better instructional quality.

As there is no single definition and conceptualization of well-being, Linton et al. (2016) suggested using the concept as an umbrella term. In this study we also conceptualized school staff members' professional well-being "as a multidimensional construct, reflecting themes that often overlap" (Linton et al., 2016; p. 13). This study addressed the overlapping themes of work-related stress, the experience of competency when further developing educational practice, and job satisfaction. These themes refer to Deci and Ryan's (2008) work on analyzing well-being from both a hedonic and eudaimonic tradition. Following the hedonic approach, most prominently represented by the work of Diener (1984, 2009), professional well-being

can be conceptualized as the absence of negative affect. In this study, therefore, hedonic professional well-being was assessed in terms of school staff members' work-related stress level. Thus, a high level of professional well-being means that individuals reported a low level of stress. However, experiencing work-related stress does not necessarily mean that individual school staff members are not happy with their job. Thus, from an eudaimonic perspective, professional well-being is about having a meaningful job and thus experiencing a high level of competency at the workplace (Waterman, 1993). In this study, therefore, we looked at an individual's experience of competency regarding further developing educational practice in particular. We are aware that these two facets of professional well-being are interdependent dimensions. To emphasis this overlap between a hedonic and eudaimonic professional well-being we therefore, as a last theme, also assessed an individual's job satisfaction. We argue that satisfaction with the job may be an expression of both hedonic or eudaimonic professional well-being and therefore functions as a link between these two traditions.

But how does professional well-being relate to school staff members' brokerage? Previous research found that teachers' social relationships play a major role if someone is feeling well or not (Hascher and Waber, 2021). Thus, when implementing new organizational structures to increase school staff members' involvement in school improvement, it is crucial to understand how these structures may impact school staff members' professional well-being. Or in other words, when brokers within schools feel significantly worse than their colleagues, caution is advised when formalizing bridge-building structures (i.e., by implementing steering groups). In the following section we therefore provide an overview of how brokerage and professional well-being are interrelated concepts.

Brokerage and professional well-being

There are several reasons why brokerage is said to be related to individual and collective professional development. First, by mobilizing knowledge across groups of actors, brokers have immediate access to non-redundant information and innovative ideas. Second, they may filter, distort, or hoard resources available only to them by controlling the flow of information. Third, they may disrupt (dysfunctional) routines, as they introduce new perspectives on daily practices (McGrath and Krackhardt, 2003; Burt, 2005; Obstfeld, 2005; Lomas, 2007; Ward et al., 2009; Meyer, 2010). In this way, brokers generate innovative ideas, increase the quality of creative work, make advice and knowledge more accessible, and can act synergistically with network cohesion and strong ties to produce environments in which collaboration can flourish (Long et al., 2013; Kwon et al., 2020). Although there is ample evidence for positive relationships between brokerage and professional development, research on the associations of brokerage with professional well-being is scarce. However, we argue that the findings on professional development listed above allow us to formulate hypotheses in an exploratory way on how brokerage relates to professional well-being.

Brokerage and work-related stress (hedonic professional well-being). On the dark side of brokerage, previous studies indicated that being in-between different groups of actors may result in higher stress (Krackhardt, 1999; Kislov et al., 2017). Krackhardt (1999) pointed out that especially brokers having strong ties to the various groups they are connecting may experience stress, as they are more often confronted with incompatible expectations on either side, need to balance the interests of different groups, and risk violating norms that are crucial in one but not the other group. Therefore, Krackhardt (1999) referred to brokerage also as "the ties that torture." In research beyond the professional context with a focus on friendship networks, previous research also found negative associations between brokerage and psychological well-being (Carboni and Gilman, 2012; Mollenhorst et al., 2015). Up to now, only one qualitative study (Jusinski, 2019) analyzed the relation between brokerage and stress. Jusinski found that educators in an intermediary position more often risked overload and burn-out, as they were vulnerable to exploitation on both sides of the gaps that they were bridging. Moreover, the fine-grained approach of this present study in assessing multiple facets of brokerage simultaneously allows to test whether this first assumption holds to be true for formal, structural, and behavioral brokerage.

Brokerage and experience of competency when further developing educational practice (eudaimonic professional well-being). To our knowledge, there is no empirical study available that examined the associations of brokerage with an individual's experience of competency. However, following Burt's (2005) assumption that individuals in a brokerage position not only do better but also feel better, there are theoretical arguments that support the claim that brokers feel more competent when further developing educational practice compared to their colleagues. Burt argued that brokers are less constrained in their professional networks and therefore have more leeway to shape their social worlds (Burt, 1992, 2005). As a consequence, they experience themselves as more powerful and have more success when negotiating agreements (i.e., Stovel and Shaw, 2012; Quintane and Carnabuci, 2016). Regarding the school context, previous research found that being in a brokerage position is positively associated with a higher level of self-confidence and the experience of more autonomy at work (Hopkins et al., 2013; Slavit and Roth McDuffie, 2013). We therefore assume that teachers and principals in brokerage positions also tend to feel more competent when it comes to changing the school's educational practice. Again, in the current study this claim was examined in a differentiated way by analyzing it regarding the three different facets of brokerage.

Brokerage and job satisfaction (combining hedonic and eudaimonic professional well-being). It is quite likely that

individuals' having access to different social worlds and being in an exclusive and powerful position to control the flow of information within a professional network are more satisfied than others with their jobs. Moreover, having more success in terms of professional development may also result in higher job satisfaction. However, it is also reasonable to assume that brokerage is negatively correlated with job satisfaction. For example, in Wenger's (1999) communities of practice theoretical framework, Wenger pointed out that brokers more likely experience isolation by only connecting but not really belonging to any group. The feeling of being isolated within a team may have a negative impact on an individual's job satisfaction. If school staff members' brokerage was indeed associated with a higher job satisfaction was tested regarding their formal role (being a member of the school's steering group), their structural network position (bridging structural holes in the school's professional network), and their network behavior (applying brokerage activities).

Differential effects of brokerage on professional well-being. We assume that having or not having the formal mandate to act as a broker may moderate the relationship between brokerage and professional well-being. This is due to the fact that previous studies yield an inconsistent picture when it comes to the dynamics between formal and both structural and behavioral brokerage. Whereas some studies found that informal leaders within a team lack legitimacy to be brokers (Hopkins et al., 2013; Nordholm, 2016), others indicated that by formalizing educators as brokers, credibility among teacher colleagues declines, and the effectiveness of brokerage activity is diminished (Jusinski, 2019). In the following, we therefore analyze whether formal brokerage moderates the relationships between other facets of brokerage (structural and behavioral) and a school actor's professional well-being. Following Nordholm's (2016) argumentation, it may be the lack of formal legitimacy that constrains the positive impact of brokerage on well-being. We therefore assume that congruence between school staff members' formal mandate to act as a broker and both their structural position and bridge-building behavior is more significantly associated with an individual's professional well-being.

In sum, we argue that the relationships between brokerage and professional well-being still need to be validated, also in larger samples. In particular, there is no clear picture of whether the empirical evidence on the relations between brokerage and professional well-being from research outside of the school context is transferable to school staff members in intermediary positions within schools. This transfer is not trivial, as school staff members work, for instance, in a less hierarchical working environment than that found in in private companies or in public organizations in the health sector, where most of the studies mentioned above were conducted.

Research questions and hypotheses

Bringing these theoretical assumptions and empirical evidence together, the aims of this study are to examine different aspects of brokerage and analyze how social capital in the form of brokerage is associated with school staff members' professional well-being.

Our *first research question* is: To what extent do the different aspects of brokerage (formal, structural, and behavioral) interrelate?

- *Hypothesis 1a:* Formal brokerage is positively associated with school staff members' structural brokerage position in the school's professional network.
- *Hypothesis 1b:* Formal brokerage is positively associated with an individuals' brokerage behavior.
- *Hypothesis 1c*: Structural brokerage is positively related to school staff members' brokerage behavior.

Our *second research question* is: To what extent do the different brokerage aspects correspond to professional well-being?

- *Hypothesis 2a:* Brokerage is related to more work-related stress.
- *Hypothesis 2b*: Brokers experience themselves as more competent when further developing educational practice.
- *Hypothesis 2c:* Brokers tend to be more satisfied with their jobs.

Our *third research question* addresses the issue of whether being formally appointed to act as a broker moderates the relationships between structural and behavioral brokerage and professional well-being.

- *Hypothesis 3a:* Congruence in formal and other facets of brokerage is related to a lower work-related stress level.
- *Hypothesis 3b:* Congruence in formal and other facets of brokerage is associated with a more positive experience of competency.
- *Hypothesis 3c*: Congruence in formal and other facets of brokerage is related to a higher level of job satisfaction.

Materials and methods

To answer these research questions, we relied on a complex set of multiple data sources, such as online survey, social network, and daily practice logs data. The following sections provide detailed information on: the study design and sample, the measures applied, and the data analysis.

Study design and sample

This study was conducted in the German-speaking part of Switzerland, where over the last decades, numerous schools have adopted a formal brokerage approach by establishing steering groups to coordinate different driving forces to further develop a school's educational practice (Dubs, 2005). Except for two schools, all schools in our sample had implemented formal steering groups. This is quite surprising, as there is no federal or cantonal legislation stipulating such formal middle management infrastructures in primary schools. But the existence of steering groups in almost all of the sampled schools indicates that this kind of formal brokerage can be considered a common (and not exceptional) practice in primary schools in the German-speaking part of Switzerland. Although steering groups are popular, however, there is only scant evidence regarding the effectiveness and differences in the local manifestations of these formal middle management structures in this context. This study does not aim to examine differences in the manifestation and quality of steering groups on a school level *per se*, but we argue that our research on brokerage, situated on an individual level, may function as a starting point for further (multilevel) analysis in this field.

As part of a larger project, data was collected from multiple school actors, such as principals, and teachers ($N_{individuals}$ = 1,652; $N_{schools}$ = 59). However, as not all schools participated in filling out daily practice logs, we excluded two schools from the sample. The data from three other schools were not included, as the schools' response rates for the daily practice logs were lower than 40%. Moreover, a few schools had a response rate lower than 70% in terms of the social network data. Since the robustness of centrality measures (such as the betweenness-centrality) relies on high enough response rates (Borgatti et al., 2006) three more schools and its participants were excluded from this study. Accordingly, for this study, we focused on the responses of 1,316 principals and teachers at 51 primary schools. All of the participants took part in the study on a voluntary basis and actively gave their informed consent to participate. Data used in this study were collected both by an online questionnaire at the beginning of the school year 2019/20 (response rate on a school level (in%): *M* = 86.5, *SD* = 7.6; *Min* = 70, *Max* = 100) and daily practice logs in three different waves, each lasting a week from Monday to Sunday (response rate in terms of all the practice logs on a school level (in%): *M* = 70.0, *SD* = 10.9; *Min* = 45.6, *Max* = 95.3).

Descriptive results for the school actors showed that 87.1% were women, and the range of years of experience at the current school was 0–45, (*N* = 1,123; *M* = 9.72, *SD* = 9.03). The sampled schools differed in size (number of staff: *M* = 25.8, *SD* = 16.0; *Min* = 6; *Max* = 72), regional context (*1* = rural to *9* = urban; *Median* = 4; *Min* = 1, *Max* = 8), and socioeconomic background of the local community (welfare ratio (in%): *M* = 2.26, *SD* = 1.7; *Min* = 0.5, *Max* = 6.3; taxable income (in CHF): *M* = 33,971, *SD* = 10,924; *Min* = 16,183, *Max* = 64,735).

A possible sampling bias was analyzed by comparing teacher demographics (gender and seniority) and school characteristics (size, regional context, and socioeconomic background) with data on all Swiss primary schools provided by the Swiss Federal Statistical Office (Federal Statistical Office [FSO], 2020). As no significant differences were found, a sampling bias could be excluded. Therefore, the database proved to be a solid ground to address our research questions.

Measures

Formal brokerage

Whether an individual was formally appointed to be a broker was assessed using the information provided *via* self-report in the online questionnaire on school staff members being (= 1) or not being (= 0) members of the school's steering group or change/quality management group (*N* = 1,316; *M* = 0.14, *SD* = 0.35). There were 184 school actors formally appointed and 1,132 not formally appointed to a brokerage position.

Structural brokerage

The online questionnaire contained a social network question about selecting all the actors in the respondents' school with whom they had exchanged ideas to further develop the school's educational practice. To assess an individual's structural brokerage, a standardized betweenness-centrality was measured (Freeman, 1977). Values between 0 and 1 indicated to what extent a school staff member is located on shortest paths when connecting all the individuals in a network (*N* = 1,129; *M* = 0.03, *SD* = 0.05, *Min* = 0, *Max* = 0.46): Higher values indicate high structural brokerage. As school size in terms of numbers of staff members influences the theoretical number of bridges an actor can possibly build, we used the standardized betweenness-centrality which takes into account the school's size when computing a betweenness-centrality score for each individual ($N_{schools}$ = 51; *Min* = 6, *Max* = 72). Additionally, this variable was multiplied by the factor of 100 to obtain more comparable ranges of the variance for all the applied variables in our statistical model (*N* = 1,129; *M* = 2.77, *SD* = 5.08, *Min* = 0, *Max* = 45.8).

Behavioral brokerage

School staff members' bridge-building behavior was assessed using a short form of Obstfeld's "Brokerage *tertius iungens* orientation" measurement instrument (Obstfeld, 2005). In the original version, the brokerage orientation was assessed based on six items with a 7-point Likert scale (Cronbach's alpha = 0.88). Due to the principle of parsimony, we assessed only four of these items, covering different aspects, such as whether teachers see opportunities for collaboration between

people or whether they introduce school actors to each other who might have a common strategic work interest (see **Table 1**). The test instrument was assessed using a 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Results revealed a high reliability of the test instrument (N = 1,114; M = 3.77, SD = 0.91; Cronbach's α = 0.85). *Further,* a confirmatory factor analysis was conducted to test empirically our theoretical measurement instrument adapted from Obstfeld (2005). The measurement instrument based on four items revealed acceptable model fit indices: χ^2 (2) = 31.274, $p < 0.001$, scaling correction factor Yuan-Bentler correction (Mplus variant) = 1.456: CFI = 0.98, TLI = 0.93; RMSEA [90% CI] = 0.138 [0.098 –0.183], SRMR = 0.026. We are aware that the values for the root mean square error approximation (RMSEA) clearly deviate from the cut-off value close to.06 suggested by Hu and Bentler (1999). However, as Kenny et al. (2015) indicated, the RMSEA in properly specified models with a small number of degrees of freedom (in our case df = 2) often falsely indicates a poor fitting model. We therefore evaluated the goodness of fit for our latent construct based on all the other alternative fit indices not or less dependent on the degrees of freedom (such as CFI, TLI, and SRMR). As all of these values revealed an acceptable fit, we went on to address our research question based on our measurement instrument. Moreover, intraclass correlation coefficients (ICC_1 = –0.010; ICC_2 = –0.283) indicated that school actors did not resemble each other based on the school they belonged to Lüdtke and Trautwein (2007). Hence, behavioral brokerage, as we have theoretically outlined above, is examined most suitably on an individual level.

Professional well-being

In three waves, each lasting a week from Monday to Sunday, the school staff members were asked to fill out daily practice logs (see **Figure 1**). Each of the three aspects of school staff members' professional well-being was assessed with a single item on a 10-point Likert scale ranging from 1 (*low*) to 10 (*high*). *Work-related stress* was measured by an item asking whether school staff members experienced their working day as stressful all in all. On average, the school staff members in our sample reported being moderately stressed (N = 1,150; M = 4.33, SD = 1.75). In terms of *experiencing competency* when it comes to further developing the school's educational practice, we asked the participants when thinking back on their past working day, whether they considered it to be fruitful to further developing the school's educational practice. The results indicated that the participants experienced themselves as neither very incompetent nor competent—although variation among the participants was high (N = 1,150; M = 5.05, SD = 1.96). School staff members' *job satisfaction* was assessed by asking whether they felt satisfied with their working day all in all. In general, the participants reported being quite satisfied (N = 1,151; M = 7.86, SD = 1.04). The different themes of professional well-being were each aggregated separately as a mean score across the three weeks for every participant. In this way, a school staff member's average stress level, experience of competency, and job satisfaction was measured. School staff members with equal or less than three completed daily practice logs were set to missing.

School actors' demographics

Regarding school staff's demographics, experience and familiarity with the local context of a school (tenure) and workload were included as possible confounding variables regarding brokerage or professional well-being. On average, school staff members in our sample had worked for almost 10 years at their present school (N = 1,123; M = 9.72, SD = 9.03). The information on teachers' percentage of full-time employment (full-time position = 100%) was gathered directly from the principal and recorded with a dichotomous variable (0 = less than 75%, 1 = more than 75%). Staff members employed less than 75% slightly outnumbered the staff employed with at least 75% employment (N = 1,297; M = 0.44, SD = 0.50).

Data analysis procedures

To answer our research questions, we relied on multiple data analysis procedures: bivariate correlational analysis, measurement invariance analysis, and multiple group structural equation modeling. The different procedures and their contribution to this study are briefly outlined in the following sections.

Bivariate correlational analysis

To answer our first research question, we analyzed the associations between the different brokerage aspects (formal, structural, and behavioral) based on bivariate correlational analyses. To answer our second research question, we examined the relationships of the three brokerage facets to the three different aspects of professional well-being (feeling of competency, job satisfaction, and stress) and other teacher demographics (such as tenure and workload) also based on bivariate correlational analysis.

Establishing measurement invariance

For our third and last research question, we examined a moderation effect in the differences in brokerage and professional well-being based on (non-) membership in the school's steering group (formal brokerage). Hence, the question of measurement invariance was addressed in terms of factorial or measurement invariance of the constructs across the two different subgroups (Little et al., 2007). Establishing measurement invariance enabled us to compare the (structural and behavioral) brokerage and professional well-being of school actors who were members or not members of the school's steering group (formal brokerage). Following Okech (2012), we

TABLE 1 Measurement instrument to assess school actors' behavioral brokerage.

Item	N	*M*	*SD*	r^{it}	α-drop	α
1. I introduce people to each other who might have a common strategic work interest.	1,115	3.48	1.19	0.73	0.78	–
2. I see opportunities for collaboration between people.	1,118	4.05	1.03	0.68	0.81	–
3. I point out the common ground shared by people who have different perspectives on an issue.	1,116	3.79	1.03	0.58	0.85	–
4. I introduce people when I think they might benefit from becoming acquainted.	1,115	3.77	1.16	0.75	0.77	–
Latent construct Behavioral brokerage (strongly disagree = 1; strongly agree = 6)	1,170	3.77	0.91	–	–	0.85

M = mean and *SD* = standard deviation. r^{it} indicates item-total correlation coefficients. α-drop indicates Cronbach's alpha of latent construct if item is dropped. α indicates Cronbach's alpha of the latent construct.

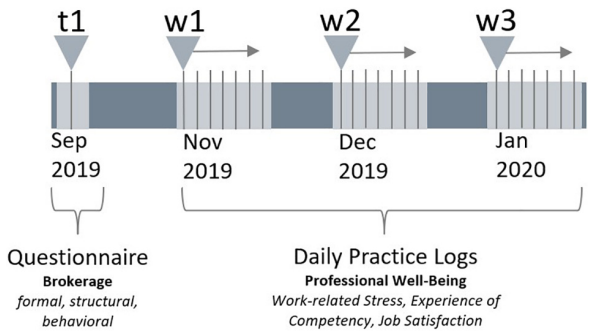


FIGURE 1
Illustration of the data collection for both the online questionnaire at the beginning of the school year 2019/20 and the three waves in which daily practice logs were collected.

iteratively conducted analyses to establish configural, weak, and strong invariance.

In a first step, configural invariance was tested in which the same factor structure is maintained across groups. However, as configural invariance only provided a basic and not sufficient requirement for cross-group comparison, further more meaningful degrees of invariance were sought to be established (Little et al., 2007). Hence, in a second step, weak factorial invariance, in which the loadings of the indicators were equated across groups, was tested. However, to compare the constructs meaningfully across groups, measurement equivalence with strong factorial invariance (or at least partial strong factorial invariance) has to be established (Little et al., 2007). Consecutively, in a third step, we fixed both the loadings and the intercepts of the indicators across the groups. In our case, strong invariance means that school actors who participated in steering groups and those who did not will have the same expected scores on the measured indicators of these constructs when they report the same level of (structural and behavioral) brokerage and similar professional well-being. If measurement equivalence is achieved, the examination of similarities and differences in terms of variances, covariances, and means can be analyzed (Okech, 2012). Following the tests of measurement invariance, the relationships were assessed using a multiple group approach to structural equation modeling (SEM).

Multiple group analysis

A multiple group SEM (structural equation modeling) technique was applied to test correlations among the constructs across groups. Formal brokerage was used as the grouping variable (0 = no formal brokerage; 1 = formal brokerage).

Goodness of fit

Fit indices of the confirmatory factoring analysis, measurement invariance, and multiple group models (such as the RMSEA, CLI, TLI, and SRMR) were estimated by applying a robust maximum likelihood estimator (MLR) for the correction of data that is not normally distributed (Satorra and Bentler, 1994). Additionally, missing data was estimated with the full information maximum likelihood method (Arbuckle et al., 1996). Further, as the assumption of non-independence of the observations was violated, due to a complex nested data structure, we applied a survey design approach—more frequently known as the Type = COMPLEX function in mPlus

(Muthen and Satorra, 1995). In this way, unbiased estimators were calculated by introducing the cluster variable 'school.'

All analyses—confirmatory factoring analysis, bivariate correlational analysis, and multiple group SEM—were computed using the lavaan package Version 0.6-9 (Rosseel, 2012) in R (R Studio-Team, 2020).

Results

The results are reported in four different subsections, following our research questions and the analytical procedures outlined above. Hence, we first report on the different facets of brokerage and their associations with each other, school actors' demographics, and professional well-being. To conduct the multiple group analysis for school actors' being (or not being) formally appointed to act as brokers, we outline the establishment of measurement invariance. Finally, we report the group comparisons in terms of correlation coefficients.

Bivariate correlational analyses for the different facets of brokerage

To address our first two research questions on the degree of interrelatedness of the different facets of brokerage and their associations with professional well-being we computed bivariate analyses (see **Table 2**). The model fit was acceptable: χ^2 (23) = 98.670, $p < 0.001$, scaling correction factor Yuan-Bentler correction (Mplus variant) = 0.981: CFI = 0.97, TLI = 0.92; RMSEA [90% CI] = 0.057 [0.046 –0.069], SRMR = 0.021. The covariance matrix indicated that the three brokerage dimensions were only weakly interrelated, revealing that brokerage seems to be indeed a multifaceted concept.

As the significance level for each association among the different facets of brokerage was below the cut-off value of $p = 0.5$, we rejected the null hypotheses and accepted the alternative hypotheses. Hence, our results indicated that formal and structural brokerage were significantly correlated *(hypothesis 1a)*. Moreover, in regarding *hypothesis 1b*, formal and behavioral brokerage were also significantly associated with each other. Further, behavioral brokerage also corresponded significantly with structural brokerage (*hypothesis 1c*).

Regarding effect sizes, all the relationships tended to be moderate to weak—with formal to structural brokerage having the strongest association (β = 0.273), followed by the association between structural and behavioral brokerage (β = 0.177). Formal and behavioral brokerage seemed to have the weakest link to each other (β = 0.106).

The results for our second research question indicated that formal (β = 0.055), structural (β = 0.047) and behavioral brokerage (β = 0.060) were not related to school actors' stress level. Therefore, *hypothesis 2a* could not be accepted. However, an individual's self-evaluation about feeling competent concerning further developing their school's educational practice was significantly related to all facets of brokerage (*hypothesis 2b*). The strongest relationship was revealed between behavioral brokerage and school actors reporting feeling competent (β = 0.270). The associations between formal brokerage (β = 0.073) and structural brokerage (β = 0.177) corresponded to a lesser extent with the feeling of competency in further developing the school's educational practice. Further, school actors in brokerage positions did not report doing and feeling better in terms of job satisfaction—both in terms of formal brokerage (β = –0.006) and structural position in the school's network (β = 0.010). However, a weak significant correspondence was revealed between brokerage behavior and job satisfaction (β = 0.065). Hence, *hypothesis 2c* could be accepted only partially.

Additionally, regarding demographics, an individual's workload was significantly related to formal brokerage (β = 0.155) and structural brokerage (β = 0.130). No association was found between behavioral brokerage and school actors' percentage of full-time employment (β = 0.045). Tenure could only be associated with structural brokerage (β = 0.200). In contrast, both formal brokerage (β = 0.053) and behavioral brokerage (β = 0.025) were not significantly connected with an individual's seniority at the current school.

Invariance testing across groups

Establishing measurement invariance across the two groups for our latent construct succeeded only partially (see **Table 3a**). Based on the model fit indices, configural invariance was supported. Because the first p-value was non-significant, we concluded that weak invariance (equal factor loadings) was supported in this dataset. Hence, the minimal requirements for conducting a multiple group analysis were fulfilled. However, because the second p-value was significant, strong invariance could not be established. Nevertheless, when conducting a multiple group SEM analyses the model revealed viable information, as the fit indices for all the models revealed acceptable values (see **Table 3b**). This indicated that even when establishing measurement equivalence across the two groups (strong invariance) group comparisons were tenable.

Multiple group analysis

Robust maximum likelihood estimation for the structural equation model based on multiple groups of formal and non-formal brokerage and having considered the nested data structure by introducing the cluster variable 'school' revealed a decent model fit: χ^2 (28) = 81.794, $p < 0.001$, scaling correction factor Yuan-Bentler correction (Mplus variant) = 1.044:

CFI = 0.97, TLI = 0.95; RMSEA [90% CI] = 0.063 [0.047 – 0.079], SRMR = 0.024.

Figure 2 shows the path diagrams for the two groups: In broad terms, the direction and significance of the various associations in terms of correlation coefficients did not differ for the two groups. Behavioral brokerage and structural brokerage were both significantly correlated. However, this relationship was much stronger in the formal brokerage group (β = 0.28) than in the no formal brokerage group (β = 0.14). This pattern was also visible when examining the connectedness of behavioral brokerage and competency in further developing educational practice. Whereas interdependence of these aspects was relatively strong in the formal brokerage group (β = 0.37), this association was significantly lower in the other group (β = 0.22). However, there was no significant difference when comparing the associations between structural brokerage and the feeling of being competent in further developing educational practice (formal: β = 0.18; no formal: β = 0.12). In both groups the relationships between brokerage and stress were non-significant. However, a differential effect was revealed when comparing the associations between brokerage and an individual's job satisfaction: Whereas we identified negative relationships between brokerage and job satisfaction in the formal brokerage group no such effects revealed for the no formal brokerage group. The significant negative associations (more brokerage less satisfied) in the formal brokerage group were stronger for behavioral brokerage (β = –0.20) than for structural brokerage (β = –0.13). However, in the group of actors not formally appointed to fulfill a brokerage position there were no significant relationships between brokerage and job satisfaction—behavioral brokerage (β = 0.02) and structural brokerage (β = –0.01). Hence, when it comes to our third research question *hypothesis 3b* can be accepted. Formal brokers actually being seen as in-betweens by others (structural brokerage) and applying bridge-building strategies (behavioral brokerage) experienced themselves significantly more competent in further developing educational practice when compared to non-formal brokers who were in a brokerage network position and showing brokerage behavior. Moreover, a differential effect in terms of brokerage and job satisfaction (*hypothesis 3c*) revealed. Although in contrast to our hypothesis, formal brokers report to be less and not more satisfied when

TABLE 2 Intercorrelations between demographic variables, brokerage (formal, structural, and behavioral), and school staff's well-being.

Variables	1	2	3	4	5	6	7
Demographic variables							
1. Tenure (in years)	–						
2. Percentage of full-time employment	−0.068*	–					
Brokerage							
3. Formal brokerage	*0.053*	0.155***	–				
4. Structural brokerage	0.200***	0.130***	0.273***	–			
5. Behavioral brokerage	*0.025*	*0.045*	0.106*	0.177***	–		
Well-being							
6. Competency improving educational practice	0.116**	*–0.023*	0.073**	0.177***	0.270***	–	
7. Satisfaction	*0.102***	*−0.008*	*−0.006*	*0.010*	0.065*	0.324***	–
8. Stress	*−0.028*	0.153***	*0.055*	*0.047*	*0.060*	0.095**	–0.313***

Correlation coefficients are given at the individual level. ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$; non-significant effects in italics. Latent construct (5) is based on four items, each rated on a 6-point Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

TABLE 3a Comparison of test statistics when establishing configural, weak, and strong measurement invariance across groups.

Model	df	AIC	BIC	χ^2	$\triangle\chi^2$	△df	*P*-value
Configural invariance	28	27,226	27,521	85.395	–	–	–
Weak invariance	31	27,229	27,509	94.132	7.386	3	0.061
Strong invariance	38	27,271	27,517	150.399	59.618	7	< 0.001

TABLE 3b Fit indices for the configural, weak, and strong invariance model.

Model	χ^2-*Robust*	RMSEA [90% CI]	CFI	TLI	SRMR	Tenable?
Configural invariance	81.794	0.063 [0.047 –0.079]	0.97	0.95	0.024	yes
Weak invariance	89.016	0.063 [0.048 –0.078]	0.97	0.95	0.028	yes
Strong invariance	145.099	0.076 [0.063 –0.089]	0.95	0.92	0.041	yes

being in a brokerage position or applying brokerage strategies. No such differential effects were revealed in terms of work-related stress level (*hypothesis 3a*).

Discussion

The aims of this article were to analyze brokerage in a more comprehensive way and examine its relation to professional well-being. As a first insight, our results reveal that brokerage seems to be indeed a multifaceted concept. A general answer to our first research question therefore is that formal, structural, and behavioral brokerage are different aspects of a school's collaboration structure. These aspects are interrelated but cannot be treated interchangeably. As a second insight, addressing our second research question, our findings reveal that brokerage and professional well-being correspond only partially. Finally, regarding our third research question, the existence or absence of formal brokerage has only a limited moderating influence on the relationships between individuals' structural or behavioral brokerage and their professional well-being.

In the following sections we further elaborate on relevant key contributions of this study and present the study's practical implications. We outline the study's limitations and where to go next in terms of future research on brokerage. In the concluding section, we sum up the contributions of this study.

Key contributions and practical implications

Our *first research question* addressed the issue of whether formal, structural, and behavioral brokerage are different approaches to examining a single aspect or multiple aspects of bridge-building interactions among disconnected school actors. As a *first contribution*, our results confirm our assumption that the three facets of brokerage cannot be used interchangeably and that they instead function as complements. However, at least to a certain degree, they correspond to each other. As a first practical implication, we want to indicate that future research in the domain of school improvement needs to describe transparently how they theoretically frame and methodologically assess the brokerage concept.

Going more in-depth, we want to highlight our *second contribution* that formal brokerage is associated with school actors' brokerage behavior (*hypothesis 1b*). Hence, our results confirm the findings of previous research (i.e., Spillane and Kim, 2012; Daly et al., 2014b). It seems that "title does not dictate behavior" since individuals' behavioral brokerage is not determined by formal organizational leadership structures. In our case, school staff as members of a steering group only marginally report being more active bridge-builders among disconnected subgroups than school actors having no formal mandate to do so. Therefore, we raise the question as to whether school-internal steering groups actually fulfill their purpose to connect the strategic center of the school (leadership group) to the periphery (i.e., subgroups). There are multiple tentative explanations for these findings.

For instance, formal brokers may lack instructions concerning the aims of a steering group and therefore may simply not be aware of the importance of applying brokerage behavior, acting as gatekeepers and representatives. As a second practical implication, then, school actors may need to critically reflect on the purpose and manifestation of formal leadership groups in their organization.

Our second interpretation is related to the "autonomy parity pattern" (Lortie, 1975) among teachers that is at stake when implementing a middle leadership structure such as a steering group (Feldhoff et al., 2010). Members of a steering group may be confronted with the rejection by other staff members—which may result first in constraining their potential to build bridges and in the long run may inhibit their willingness to be active in-betweens. Again, school staff members need to have the opportunity to express their doubts and address their concerns when new leadership structures are implemented. This might be done in collective sense-making processes (Coburn, 2005) in which means and ends of formalized brokerage structures are presented, discussed, and, if necessary, adjusted for the local context. In these negotiation processes, school teams, for instance, can develop a more differentiated understanding of what teacher autonomy is and come to see that more cooperative practice is not necessarily a threat to an individual's autonomy (Vangrieken et al., 2017).

Finally, our third interpretation addresses the issue that social bridges in a school's network are built to a great extent in informal ways. From a socio-constructivist perspective, this finding mirrors the fact that schools are more organic than mechanical organizations (Mitchell and Sackney, 2011). Hence, school actors not officially mandated to act as brokers may sidetrack the formal organizational structure (Spillane and Kim, 2012).

There is more evidence for such a sidetracking effect of formal leadership structures by informal brokers: As correspondence of an individual's formal to structural brokerage (*hypothesis 1a*) is only moderately strong, the steering group members' structural brokerage position does not necessarily reflect the formal leadership structure. This is the *third contribution* of our study: Confirming previous studies about brokerage in the domain of school improvement (i.e., Spillane and Kim, 2012; Daly et al., 2014a) network structures are influenced but not determined by formal organizational structures.

Our *fourth and final contribution* related to the first research question is that, as *a priori* hypothesized, structural and behavioral brokerage are interrelated (*hypothesis 1c*)—although again merely to a modest degree. Hence, actors in a brokerage

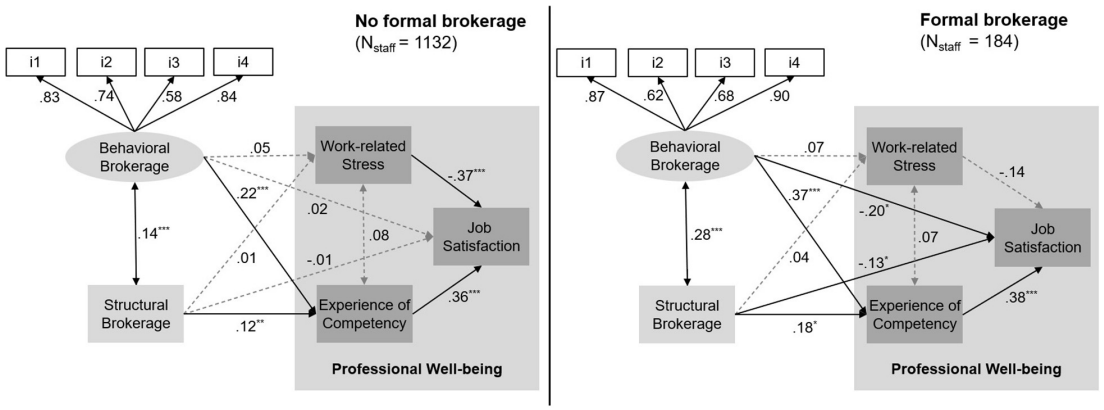


FIGURE 2

Results of the multiple group structural equation modeling analysis of formal and non-formal brokerage (cluster = school; MLR). χ^2 (28) = 81.794, $p < 0.001$, scaling correction factor Yuan-Bentler correction (Mplus variant) = 1.044: CFI = 0.97, TLI = 0.95; RMSEA [90% CI] = 0.062 [0.047 −0.079], SRMR = 0.024. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

network position do tend to apply brokerage activities more often. However, there is room for actors not in a brokerage position to fulfill the role of linking agents, or for individuals that are identified as brokers from a structural perspective to refrain from taking advantage of their position. At this point, we can only speculate whether they cannot or do not want to apply brokerage behavior, or whether they are simply not aware of the fact that they are intermediaries between different subgroups and individuals within the school's social network.

Our *second research question* was about the relationships between the different facets of brokerage and professional well-being. As a *fifth contribution,* our findings do not confirm that brokerage is related to more work-related stress. This is in contrast to previous studies outside of the school context that found that individuals building bridges among disconnected others more often report a higher stress level (i.e., Krackhardt, 1999; Mollenhorst et al., 2015; Kislov et al., 2017). Hence, we had to reject our *hypothesis 2a*.—neither formal, structural or behavioral brokerage are reflected in higher stress. Thus, when referring to Deci and Ryan's (2008) work about well-being, school staff members' brokerage seems not to be related to presence or absence of negative affect (*hedonic aspect* of professional well-being).

However, there is a different picture evolving when it comes to an individual's experience of competency in further developing the school's educational practice (*eudaimonic aspect* of school staff members' professional well-being). We assumed that brokerage is more positively associated with an individual's experience of competency when it comes to further developing their school's educational practice (*hypothesis 2b*). As a *sixth contribution* we want to emphasize that our results confirm this relationship—which up to now had been only examined based on small samples in qualitative case studies (e.g., Slavit and Roth McDuffie, 2013; Jusinski, 2019). In addition, our results reveal a more fine-grained picture: Whereas brokerage behavior is substantially associated with the experience of competency, this association is weaker when it comes to structural brokerage. Being in a formal brokerage position, however, is only marginally correlated with this aspect of professional well-being. As a practical implication derived from these findings, we suggest making school staff members in formal brokerage positions more aware of the importance of brokerage behavior. Moreover, formal brokers need to be well-equipped with strategies for transferring knowledge, linking disconnected others, or supporting capacity-building processes (Ward et al., 2009).

Concerning job satisfaction, we examined whether there is a positive relationship between brokerage and the tendency to not only do but also feel better (*hypothesis 2c*). The *seventh contribution* of this paper is that there is no such association when it comes to formal and structural brokerage in the school context. However, brokerage behavior is weakly interconnected with job satisfaction. These findings indicate that the tendency to feel better is only related to actual brokerage behavior. There are multiple reasons why this evidence, most prominently advocated by Burt (2005), does not hold true for school staff members: Possible explanations may be, the less hierarchical leadership structures, the limited monetary incentives available to reward staff members, or the limited career perspectives in most primary schools (Rowan, 1994; Ingersoll and Collins, 2018). Although educators act as brokers within their schools, their brokerage seems to be not that rewarding. This is critical, as previous research indicated that brokerage might be beneficial when it comes to changing organizational practice sustainably. Hence, educational policymakers and central district staff should come up with ideas and solutions on how to create conditions in which school actors can profit individually when taking up formal or structural brokerage positions.

Finally, our *third and final research question* examined a potential moderation effect in terms of formal brokerage. We followed the argumentation of Hopkins et al. (2013) and Nordholm (2016) that a lack of formal legitimacy diminishes the benefits related to an individual's brokerage. Hence, we assumed that a school staff member's formal mandate to act as a gatekeeper or representative of subgroups within the school organization is more significantly associated with professional well-being—in terms of a lower stress level (*hypothesis 3a*), a more positive experience of competency (*hypothesis 3b*) and a higher level of job satisfaction (*hypothesis 3c*). As an *eight contribution*, a general picture of our results indicates that the two groups of no formal brokerage and formal brokerage do not differ substantially when it comes to the interrelatedness of structural and behavioral brokerage and also when it comes to their associations with work-related stress. Thus, both formal and no formal brokers do not report to be experience a higher stress level when compared to their colleagues.

However, *our ninth contribution* in the form of a more fine-grained analysis of the two groups reveals differential effects in terms of the strength and directions of some correlations. In both groups, formal and no formal brokers, brokerage behavior is associated with the feeling of competency. However, this relationship is significantly more intense in the group of formal brokers. As a practical implication, therefore, we suggest either thinking about formalizing brokerage within the school or to making sure that in the long run informal brokerage is made more visible, appreciated, and rewarded. Our findings reveal another difference considering job satisfaction. Whereas both structural and behavioral brokerage in the non-formal group is not related to job satisfaction our results show that in the formal brokerage group these relationships are significant. However, in contrast to our hypothesis, these effects are negative. This last differential effect is not in line with previous studies (Hopkins et al., 2013; Nordholm, 2016). Having a formal mandate to build bridges in this regard is not more but less rewarding on an individual level. These mixed results in terms of formal legitimacy indicate that there is no single best solution. Whereas formalizing brokerage diminishes an individual's job satisfaction, it increases the experience of competency. Hence, it might be about weighing the benefits and drawbacks carefully when implementing new formal leadership structures.

Limitations and further research

The study has several limitations that should be noted: As a first limitation of this study, we want to acknowledge that this study was only exploratory in its nature. The bivariate correlational analyses applied offer a first insight about how the different facets of brokerage interrelate and how school staff members' brokerage is associated with their professional well-being. However, social network data is dependent data (Robins, 2015). School staff members' betweenness-centrality (structural brokerage) is therefore a relational information and depending on the positions of all their other colleagues in the school's professional network. Thus, the assumption that all variables in our statistical models were observed independently was violated (Hox et al., 2017). Future research needs to validate the associations of brokerage with school staff members' professional well-being based on more sophisticated methodologies that combine multigroup SEM with social network analyses. For instance, the multiple-membership multiple-classification models for social network and group dependencies by Tranmer et al. (2014) might provide a promising starting point to bring these two methodologies together.

A second limitation is that we did not collect data about a school's history with its steering group. Future studies might take a closer look at for how long a formal leadership group has been in place, or whether there were any more or less successful episodes related to the leadership group.

Another limitation of the study is that the way formal brokers were selected from the school team has been neglected. There are different reasons why certain school actors join a formal leadership group. Some school actors might be highly motivated and willing to join the group voluntarily. Others are less committed and see this position merely as a compulsory task. These differences might be essential when examining an individuals' brokerage position, brokerage behavior, and professional well-being.

Moreover, our study relied on cross-sectional data only. Future studies with longitudinal designs might further examine the relationships between brokerage and professional well-being—also in causal directions.

Finally, there has been criticism of assessing individuals' brokerage based on the betweenness-centrality. For example, Gould and Fernandez (1989) argued that solely being multiple times on long paths from one end of the network to the other does not necessarily indicate "a very important role in purposive social interaction" (p. 95). Keeping track of and making use of the complex social interaction patterns several steps beyond the people to whom an individual is directly connected seems impractical. Gould and Fernandez therefore suggested focusing exclusively on the direct links connecting otherwise disconnected actors. Hence, scholars may conduct brokerage research based on alternative approaches when assessing an individual's structural position.

Conclusion

In this study, we wanted to raise the question of whether school actors being formally entitled to act as intermediaries

between the school principal and the various sub-teams within their schools actually demonstrate bridge-building behavior. Or to what degree school actors lacking formal entitlement still act as gatekeepers and representatives – just in informal ways. Our study revealed on an exploratory basis that school actors' entitlement to act as formal brokers does not dictate their behavior. However, the degree individuals take up a brokerage position in the school's social network and their bridge-building behavior are both influenced by formal brokerage. Hence, in this case, title does not determine but affects an individual's behavior.

Moreover, we addressed the research question whether brokerage is related to professional well-being in a multifaceted way. We conclude that our findings contribute to a better understanding of the social capital of school staff within a school organization and also to the exploration of how social positions are related to important psychological dimensions. To sum up, our results point out that brokerage and professional well-being have to be assessed in a context-sensitive way. The positive relationships that have been found between having an intermediary position and professional well-being seem to be true only when it comes to eudaimonic aspects of professional well-being (in our case, an individual's experience of competency when further developing educational practice). No such effects were identified in terms of hedonic aspects of professional well-being (work-related stress). However, in contrast to previous findings, our study revealed that building bridges in a formal brokerage position is negatively related to job satisfaction. These findings emphasize the urgent need to address the issue of professional well-being in a differentiated way when it comes to the context of school improvement. The brokerage concept is just one way to start.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors as soon as the research project is finished, without undue reservation. Requests to access the datasets should be directed to BR, beat.rechsteiner@ife.uzh.ch.

Ethics statement

The studies involving human participants were reviewed and approved by Ethikkomission der Philosophischen Fakultät (University of Zurich). The patients/participants provided their written informed consent to participate in this study.

Author contributions

KMM, AW, and BR organized the database. BR wrote the first draft of the manuscript with input from all authors. BR and KMM developed the theoretical assumptions in the introduction. BR wrote the section about Materials and Methods and performed the statistical analyses. MC, AW, and KMM verified the analytical methods. KMM and AW supervised the research project. All authors discussed the results and contributed to the final manuscript, conception and design of this study.

Funding

Work on this manuscript was done within the research project "School Improvement Capacity for Academic Learning," which was supported by Grant 175872 from the Swiss National Science Foundation.

Acknowledgments

We acknowledge the work of further members of the research team in collecting the data.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

Arbuckle, J. L., Marcoulides, G. A., and Schumacker, R. E. (1996). "Full information estimation in the presence of incomplete data," in *Advanced Structural Equation Modeling: Issues and Techniques*, eds G. A. Marcoulides and R. E. Schumacker (Mahwah, NJ: Erlbaum Associates), 243–277.

Bermejo-Toro, L., Prieto-Ursúa, M., and Hernández, V. (2016). Towards a model of teacher well-being: personal and job resources involved in teacher burnout and engagement. *Educ. Psychol.* 36, 481–501.

Borgatti, S. P., Carley, K. M., and Krackhardt, D. (2006). On the robustness of centrality measures under conditions of imperfect data. *Soc. Netw.* 28, 124–136. doi: 10.1016/j.socnet.2005.05.001

Brown, C. (2019). "What is the research brokerage role that can be played by social relationships? Learning from a quantitative study from England," in *The Role of Knowledge Brokers in Education: Connecting the Dots Between Research and Practice*, eds J. Malin and C. Brown (London: Routledge), 108–122.

Burt, R. S. (1992). *Structural Holes: The Social Structure of Competition*. Cambridge, MA: Harvard University Press.

Burt, R. S. (2005). *Brokerage and Closure: An Introduction to Social Capital*. Oxford: Oxford University Press.

Carboni, I., and Gilman, R. (2012). Brokers at risk: gender differences in the effects of structural position on social stress and life satisfaction. *Group Dyn. Theory Res. Pract.* 16, 218–230. doi: 10.1037/a0028753

Carmichael, P., Fox, A., Mccormick, R., Procter, R., and Honour, L. (2006). Teachers' networks in and out of school. *Res. Pap. Educ.* 21, 217–234. doi: 10.1080/02671520600615729

Coburn, C. E. (2005). Shaping teacher sensemaking: school leaders and the enactment of reading policy. *Educ. Policy* 19, 476–509. doi: 10.1177/0895904805276143

Cooper, A. (2012). *Knowledge Mobilization Intermediaries In Education: A Cross-Case Analysis of 44 Canadian organizations*. Ph.D. dissertation. Toronto: University of Toronto.

Coppe, T., Thomas, L., Pantić, N., Froehlich, D. E., Sarazin, M., and Raemdonck, I. (2022). The use of social capital in teacher research: a necessary clarification. *Front. Psychol.* 13:866571. doi: 10.3389/fpsyg.2022.866571

Creemers, B. P., and Reezigt, G. J. (1996). School level conditions affecting the effectiveness of instruction. *Sch. Eff. Sch. Improv.* 7, 197–228. doi: 10.1080/0924345960070301

Crossley, N., Bellotti, E., Edwards, G., Everett, M. G., Koskinen, J., and Tranmer, M. (2015). *Social Network Analysis for Ego-nets: Social network Analysis for Actor-centered Networks*. Thousand Oaks, CA: Sage.

Daly, A. J., Finnigan, K. S., Moolenaar, N. M., and Che, J. (2014b). "The critical role of brokers in the access and use of evidence at the school and district level," in *Using Research Evidence: From the Schoolhouse Door to Capitol Hill*, eds K. S. Finnigan and A. J. Daly (Cham: Springer International Publishing), 13–31.

Daly, A. J., Finnigan, K. S., Jordan, S., Moolenaar, N. M., and Che, J. (2014a). Misalignment and perverse incentives: examining the politics of district leaders as brokers in the use of research evidence. *Educ. Policy* 28, 145–174. doi: 10.1177/0895904813513149

Deci, E. L., and Ryan, R. M. (2008). Hedonia, eudaimonia, and well-being: an introduction. *J. Happiness Stud.* 9, 1–11. doi: 10.1007/s10902-006-9018-1

Diener, E. (1984). Subjective well-being. *Psychol. Bull.* 95, 542–575. doi: 10.1037/0033-2909.95.3.542

Diener, E. (2009). *The Science of Well-Being: The Collected Works of Ed Diener*. Dordrecht: Springer.

Dubs, R. (2005). *Die Führung einer Schule: Leadership und Management*. Stuttgart: Franz Steiner Verlag.

Eurydice (2022). *Switzerland: Primary Education*. Available online at: https://eacea.ec.europa.eu/national-policies/eurydice/content/primary-education-67_en (accessed July 7, 2022).

Farley-Ripple, E., and Grajeda, S. (2019). "Avenues of Influence: an exploration of school-based practitioners as knowledge brokers and mobilizers," in *The Role of Knowledge Brokers in Education: Connecting the Dots between Research and Practice*, eds J. Malin and C. Brown (London: Routledge), 65–89.

Federal Statistical Office [FSO] (2020). *Bildungsinstitutionen*. Available online at: https://www.bfs.admin.ch/bfs/de/home/statistiken/bildung-wissenschaft/bildungsinstitutionen.html (accessed July 7, 2022).

Feldhoff, T., Huber, S. G., and Rolff, H.-G. (2010). Steering groups as designers of school development processes. *J. Educ. Res.* 2, 98–124.

Freeman, L. C. (1977). A set of measures of centrality based on betweenness. *Sociometry* 40, 35–41. doi: 10.2307/3033543

Gould, R. V., and Fernandez, R. M. (1989). Structures of mediation: a formal approach to brokerage in transaction networks. *Sociol. Methodol.* 19, 89–126. doi: 10.2307/270949

Grootenboer, P., Edwards-Groves, C., and Rönnerman, K. (2019). Understanding middle leadership: practices and policies. *Sch. Leadersh. Manage.* 39, 251–254. doi: 10.1080/13632434.2019.1611712

Halevy, N., Halali, E., and Zlatev, J. J. (2019). Brokerage and brokering: an integrative review and organizing framework for third party influence. *Acad. Manage. Ann.* 13, 215–239. doi: 10.5465/annals.2017.0024

Hargreaves, A., and Fullan, M. (2015). *Professional Capital: Transformng Teaching in Every School*. New York, NY: Teachers College Press.

Hascher, T. (2010). "Wellbeing," in *International Encyclopedia of Education*, eds P. Peterson, E. Baker, and B. Mcgaw (Amsterdam: Elsevier), 732–738.

Hascher, T., and Waber, J. (2021). Teacher well-being: a systematic review of the research literature from the year 2000–2019. *Educ. Res. Rev.* 34:100411. doi: 10.1016/j.edurev.2021.100411

Hopkins, M., Spillane, J. P., Jakopovic, P., and Heaton, R. M. (2013). Infrastructure redesign and instructional reform in mathematics: Formal structure and teacher leadership. *Elem. Sch. J.* 114, 200–224. doi: 10.1086/671935

Hox, J. J., Moerbeek, M., and Van de Schoot, R. (2017). *Multilevel Analysis: Techniques and Applications*. New York, NY: Routledge.

Hu, L. T., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equ. Model.* 6, 1–55. doi: 10.1080/10705519909540118

Ingersoll, R. M., and Collins, G. J. (2018). "The status of teaching as a profession," in *Schools and Society: A Sociological Approach to Education*, eds J. Ballantine, J. Spade, and J. Stuber (Thousand Oaks, CA: Sage Publications), 199–213.

Jusinski, M. M. (2019). *Hidden in Plain Sight: Knowledge Broker Teachers and Professional Development*. Montclair, NJ: Montclair State University.

Kenny, D. A., Kaniskan, B., and Mccoach, D. B. (2015). The performance of RMSEA in models with small degrees of freedom. *Sociol. Methods Res.* 44, 486–507. doi: 10.1177/0049124114543236

Kislov, R., Wilson, P., and Boaden, R. (2017). The 'dark side' of knowledge brokering. *J. Health Serv. Res. Policy* 22, 107–112. doi: 10.1177/1355819616653981

Kolleck, N. (2016). Uncovering influence through social network analysis: the role of schools in education for sustainable development. *J. Educ. Policy* 31, 308–329. doi: 10.1080/02680939.2015.1119315

Krackhardt, D. (1999). "The ties that torture: Simmelian tie analysis in organizations," in *Networks In and Around Organizations (Research in Sociology of Organizations)*, eds S. M. Bacharach, S. B. Andrews, and D. Knoke (Bingley: Emerald), 183–210.

Kwon, S.-W., Rondi, E., Levin, D. Z., De Massis, A., and Brass, D. J. (2020). Network brokerage: an integrative review and future research agenda. *J. Manage.* 46, 1092–1120. doi: 10.1177/0149206320914694

Linton, M. J., Dieppe, P., and Medina-Lara, A. (2016). Review of 99 self-report measures for assessing well-being in adults: exploring dimensions of well-being and developments over time. *BMJ Open* 6:e010641. doi: 10.1136/bmjopen-2015-010641

Little, T. D., Card, N. A., Slegers, D. W., and Ledford, E. C. (2007). "Representing contextual effects in multiple-group MACS models," in *Modeling Contextual Effects in Longitudinal Studies*, eds T. D. Little, J. A. Bovaird, and N. A. Card (Mahwah, NJ: Lawrence Erlbaum Associates Publishers), 121–147.

Lomas, J. (2007). The in-between world of knowledge brokering. *BMJ* 334, 129–132. doi: 10.1136/bmj.39038.593380.AE

Long, J. C., Cunningham, F. C., and Braithwaite, J. (2013). Bridges, brokers and boundary spanners in collaborative networks: a systematic review. *BMC Health Serv. Res.* 13:158. doi: 10.1186/1472-6963-13-158

Lortie, D. C. (1975). *Schoolteacher: A Sociological Study*. Chicago, IL: University of Chicago Press.

Lüdtke, O., and Trautwein, U. (2007). Aggregating to the between-person level in idiographic research designs: personal goal research as an example of the need to distinguish between reliability and homogeneity. *J. Res. Pers.* 41, 230–238. doi: 10.1016/j.jrp.2006.03.005

Marsden, P. V. (1982). "Brokerage behavior in restricted exchange networks," in *Social Structure and Network Analysis*, eds N. Lin and P. V. Marsden (Thousand Oaks, CA: Sage), 341–410.

McGrath, C., and Krackhardt, D. (2003). Network conditions for organizational change. *J. Appl. Behav. Sci.* 39, 324–336. doi: 10.1177/0021886303258267

Meyer, M. (2010). The rise of the knowledge broker. *Sci. Commun.* 32, 118–127. doi: 10.1177/1075547009359797

Mitchell, C., and Sackney, L. (2011). *Profound Improvement: Building Capacity for a Learning Community*. London: Routledge.

Mollenhorst, G., Edling, C., and Rydgren, J. (2015). Psychological well-being and brokerage in friendship networks of young Swedes. *Soc. Indic. Res.* 123, 897–917. doi: 10.1007/s11205-014-0766-8

Moolenaar, N. M., Daly, A. J., Cornelissen, F., Liou, Y.-H., Caillier, S., Riordan, R., et al. (2014). Linked to innovation: shaping an innovative climate through network intentionality and educators' social network position. *J. Educ. Change* 15, 99–123. doi: 10.1007/S10833-014-9230-4

Muthen, B. O., and Satorra, A. (1995). Complex sample data in structural equation modeling. *Sociol. Methodol.* 25, 267–316. doi: 10.2307/271070

Neal, J. W., Neal, Z. P., Mills, K. J., Lawlor, J. A., and Mcalindon, K. (2019). What types of brokerage bridge the research-practice gap? The case of public school educators. *Soc. Netw.* 59, 41–49. doi: 10.1016/j.socnet.2019.05.006

Nordholm, D. (2016). Knowledge transfer in school-to-school collaborations: the position of boundary objects and brokers. *Educ. Inq.* 7, 443–458. doi: 10.3402/edui.v7.28013

Obstfeld, D. (2005). Social networks, the *Tertius iungens* orientation, and involvement in innovation. *Adm. Sci. Q.* 50, 100–130. doi: 10.2189/asqu.2005.50.1.100

Obstfeld, D., Borgatti, S. P., and Davis, J. (2014). "Brokerage as a process: Decoupling third party action from social network structure," in *Contemporary Perspectives on Organizational Social Networks (Research in the Sociology of Organizations)*, eds D. J. Brass, G. Labianca, A. Mehra, D. Halgin, and S. P. Borgatti (Bingley: Emerald), 135–160.

Okech, D. (2012). Reporting multiple-group mean and covariance structure across occasions with structural equation modeling. *Res. Soc. Work Pract.* 22, 567–577. doi: 10.1177/1049731512446709

Park, V., and Datnow, A. (2009). Co-constructing distributed leadership: district and school connections in data-driven decision-making. *Sch. Leadersh. Manage.* 29, 477–494. doi: 10.1080/13632430903162541

Peetz, T. (2015). "Reforming school leadership: from primus inter pares to managers?" in *Restructuring Welfare Governance: Marketization, Managerialism and Welfare State Professionalism*, eds T. Klenk and E. Pavolini (Cheltenham: Edward Elgar Publishing), 200–214.

Pöysä, S., Pakarinen, E., and Lerkkanen, M. K. (2022). Profiles of work engagement and work-related effort and reward among teachers: associations to occupational well-being and leader–follower relationship during the COVID-19 pandemic. *Front. Psychol.* 13:861300. doi: 10.3389/fpsyg.2022.861300

Quintane, E., and Carnabuci, G. (2016). How do brokers broker? Tertius gaudens, Tertius iungens, and the temporality of structural holes. *Organ. Sci.* 27, 1343–1360. doi: 10.1287/orsc.2016.1091

R Studio-Team (2020). *R Studio: Integrated Development for R*. Boston, MA: R Studio, Inc.

Rechsteiner, B., Compagnoni, M., Wullschleger, A., Schäfer, L. M., Rickenbacher, A., and Maag Merki, K. (2022). Teachers involved in school improvement: analyzing mediating mechanisms of teachers' boundary-crossing activities between leadership perception and teacher involvement. *Teach. Teach. Educ.* 116:103774. doi: 10.1016/j.tate.2022.103774

Robins, G. (2015). *Doing Social Network Research: Network-Based Research Design for Social Scientists*. Thousand Oaks, CA: Sage Publications.

Rosseel, Y. (2012). lavaan: an R package for structural equation modeling. *J. Stat. Softw.* 48, 1–36. doi: 10.18637/jss.v048.i02

Rowan, B. (1994). Comparing teachers' work with work in other occupations: notes on the professional status of teaching. *Educ. Res.* 23, 4–17.

Satorra, A., and Bentler, P. M. (1994). "Corrections to test statistics and standard errors in covariance structure analysis," in *Latent Variables Analysis: Applications for Developmental Research*, 1st Edn, eds A. Von Eye and C. C. Clogg (Thousand Oaks, CA: Sage Publications), 399–419.

Scheerens, J. (2012). *School Leadership Effects Revisited: Review and Meta-Analysis of Empirical Studies*. Dordrecht: Springer.

Shen, J., Gao, X., and Xia, J. (2017). School as a loosely coupled organization? An empirical examination using national SASS 2003–04 data. *Educ. Manage. Adm. Leadersh.* 45, 657–681. doi: 10.1177/1741143216628533

Slavit, D., and Roth McDuffie, A. (2013). Self-directed teacher learning in collaborative contexts. *Sch. Sci. Math.* 113, 94–105. doi: 10.1111/ssm.12001

Spillane, J. P., and Kim, C. M. (2012). An exploratory analysis of formal school leaders' positioning in instructional advice and information networks in elementary schools. *Am. J. Educ.* 119, 73–102. doi: 10.1086/667755

Spillane, J. P., Shirrell, M., and Adhikari, S. (2018). Constructing "experts" among peers: educational infrastructure, test data, and teachers' interactions about teaching. *Educ. Eval. Policy Anal.* 40, 586–612. doi: 10.3102/0162373718785764

Stovel, K., and Shaw, L. (2012). Brokerage. *Ann. Rev. Sociol.* 38, 139–158. doi: 10.1146/annurev-soc-081309-150054

Tranmer, M., Steel, D., and Browne, W. J. (2014). Multiple-membership multiple-classification models for social network and group dependences. *J. R. Stat. Soc. Ser. A Stat. Soc.* 177, 439–455. doi: 10.1111/rssa.12021

Tulowitzki, P., Pietsch, M., and Spillane, J. (2021). "Leadership for learning in Germany and the US: commonalities and differences," in *International Perspectives on School Settings, Education Policy and Digital Strategies: A Transatlantic Discourse in Education Research*, eds A. Wilmers and S. Jornitz (Leverkusen: Verlag Barbara Budrich), 62–79. doi: 10.1016/j.healthpol.2021.06.012

Turner, K., and Thielking, M. (2019). How teachers find meaning in their work and effects on their pedagogical practice. *Aust. J. Teach. Educ.* 44, 70–88. doi: 10.3316/aeipt.225577

van den Boom-Muilenburg, S., Poortman, C., Daly, A., Schildkamp, K., De Vries, S., Rodway, J., et al. (2022). Key actors leading knowledge brokerage for sustainable school improvement with PLCs: Who brokers what? *Teach. Teach. Educ.* 110:103577. doi: 10.1016/j.tate.2021.103577

Van Gasse, R., Vanhoof, J., and Van Petegem, P. (2019). "Brokerage for data use in schools. Potential, occurrence and facilitators," in *An Ecosystem for Research-Engaged Schools: Reforming Education through Research*, eds D. Godfrey and C. Brown (London: Routledge), 108–122.

Vangrieken, K., Grosemans, I., Dochy, F., and Kyndt, E. (2017). Teacher autonomy and collaboration: A paradox? Conceptualising and measuring teachers' autonomy and collaborative attitude. *Teach. Teach. Educ.* 67, 302–315. doi: 10.1016/j.tate.2017.06.021

Vangrieken, K., and Kyndt, E. (2020). The teacher as an island? A mixed method study on the relationship between autonomy and collaboration. *Eur. J. Psychol. Educ.* 35, 177–204. doi: 10.1007/s10212-019-00420-0

Ward, V., House, A., and Hamer, S. (2009). Knowledge brokering: the missing link in the evidence to action chain? *Evid. Policy* 5, 267–279. doi: 10.1258/jhsrp.2009.008120

Wasserman, S., and Faust, K. (1994). *Social Network Analysis: Methods and Applications*. Cambridge: Cambridge University Press.

Waterman, A. S. (1993). Two conceptions of happiness: contrasts of personal expressiveness (eudaemonia) and hedonic enjoyment. *J. Pers. Soc. Psychol.* 64, 678–691.

Weick, K. E. (1976). Educational organizations as loosely coupled systems. *Adm. Sci. Q.* 21, 1–19. doi: 10.2307/2391875

Wenger, E. (1999). *Communities of Practice: Learning, Meaning, and Identity*. Cambridge: Cambridge University Press.

Wenner, J. A., and Campbell, T. (2017). The theoretical and empirical basis of teacher leadership: a review of the literature. *Rev. Educ. Res.* 87, 134–171. doi: 10.3102/0034654316653478

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 28 July 2022
DOI 10.3389/fpsyg.2022.866000

Check for updates

OPEN ACCESS

EDITED BY
Eva Kyndt,
Swinburne University of Technology, Australia

REVIEWED BY
Mona Baroud Nabhani,
Lebanese American University, Lebanon
Alberto Crescentini,
University of Applied Sciences and Arts of Southern Switzerland (SUPSI), Switzerland

*CORRESPONDENCE
Inken Gast
i.gast@maastrichtuniversity.nl

SPECIALTY SECTION
This article was submitted to Organizational Psychology, a section of the journal Frontiers in Psychology

RECEIVED 30 January 2022
ACCEPTED 12 July 2022
PUBLISHED 28 July 2022

CITATION
Gast I, Neelen M, Delnoij L, Menten M, Mihai A and Grohnert T (2022) Supporting the well-being of new university teachers through teacher professional development. *Front. Psychol.* 13:866000. doi: 10.3389/fpsyg.2022.866000

COPYRIGHT
© 2022 Gast, Neelen, Delnoij, Menten, Mihai and Grohnert. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Supporting the well-being of new university teachers through teacher professional development

Inken Gast*, Madelief Neelen, Laurie Delnoij, Marloes Menten, Alexandra Mihai and Therese Grohnert

Department of Educational Research and Development, School of Business and Economics, Maastricht University, Maastricht, Netherlands

Over the last decades, changes within higher education have created increased pressure and uncertainty for academics, increasing their risk for cognitive, behavioral, physical, as well as psychological issues due to high job demands. Specifically, for new academics in teaching roles, their lack of knowledge and skills can contribute to a negative effect of these job demands on their well-being. This study therefore explored how teaching-related professional development programs can enhance new university teachers' well-being, through semi-structured interviews with 10 university teachers participating in such a program at a mid-sized Dutch university. We pay special attention to the relationship between specific learning activities integrated in the program (such as learning communities, formal workshops, and reflecting) and various dimensions of the psychological model of well-being by Ryff and Keyes (such as self-acceptance, autonomy, environmental mastery, and positive relationships). Using co-occurrence analysis and content analysis, we found that different learning activities had distinct relationships with different well-being facets. For example, formal workshops were mainly related to environmental mastery, a purpose in life and personal growth, while reflecting seemed to be especially connected to teachers' self-acceptance, and participating in a learning community was mainly related to positive relations with others and personal growth. Our findings have implications for research on teacher well-being as well as for the design of professional development programs for higher education teaching staff.

KEYWORDS

psychological well-being, university teachers, professional development, faculty development, higher education

Introduction

Academics are facing increasing pressure and uncertainty due to high workload for both teaching and research, along with changing performance expectations, which can negatively impact their overall well-being at work as well as their performance (Lackritz, 2004; Watts and Robertson, 2011; Shin and Jung, 2014). Academics' work environment has become more stressful due to increasing pressure to publish and to acquire research funding in a highly competitive environment on the one hand, and through changes in education such as the digitalization of education (accelerated by the COVID-19 pandemic), increasing student numbers, and increasing personalization of support for students, on the other hand (Watts and Robertson, 2011; Kinman, 2014; Lei et al., 2021). Comparable to other service sector employees, academics are at high risk of experiencing burnout, occupational stress-related symptoms, diminished work satisfaction, and therefore, lower work well-being (Blix et al., 1994; Watts and Robertson, 2011; Kinman and Johnson, 2019), where employees with high work well-being are defined as flourishing employees who achieve their full potential (Schulte and Vainio, 2010). The human and financial costs attributable to dysfunctional employee psychological well-being have long been established, including cardiovascular diseases, long-term absence, and presenteeism (Diener, 1994; Salvagioni et al., 2017; Sabagh et al., 2018).

These concerns around well-being are exacerbated for new teaching staff, who lack the knowledge, skills, and attitudes (KSAs) to effectively manage such work demands (Hubbard and Atkins, 1995; Austin et al., 2007). New university teachers must navigate conflicting beliefs regarding their practice, which arise from professional norms, work culture, and personal expectations (Austin et al., 2007; Kessels, 2010), in environments where academics are often hired based on their academic achievements and not because of their teaching experience or interest in teaching (Morris and Usher, 2011; Graham, 2018). These new teachers are often not trained educators and have no formal teaching qualifications, which may result in low teaching efficacy (especially at the beginning of one's teaching career), low motivation, stress, and ultimately negative effects on teaching performance and psychological well-being (Morris and Usher, 2011; Butcher and Stoncel, 2012; Stewart, 2014). Consequently, new university teachers require support for becoming effective teachers, as well as for fostering their well-being at work.

Programs or interventions focusing on employee well-being are often provided outside of work or are not embedded in participants' daily work practice, which makes transfer of training to the workplace difficult (see Page and Vella-Brodrick, 2012; Karpavičiūtė and Macijauskienė, 2016). On the other hand, teacher professional development programs in higher education usually primarily focus on developing teachers' KSAs (Mathieson, 2011; Gast et al., 2017; Fabriz et al., 2021) and are therefore closely related to and embedded in teachers' work practice. However, the potential of teacher professional development programs for increasing teachers' well-being at work is often overlooked (Hubbard et al., 1998). This study therefore explores how an established teaching focused professional development program can also be effective for improving teachers' well-being. As professional development can take place through a variety of activities such as formal trainings or workshops (e.g., Steinert, 2010), informal learning on the job (e.g., Virolainen, 2007), learning in teams or through learning communities (e.g., Gast et al., 2017), or learning through individual reflection or experimentation (e.g., Clayton and Ash, 2005), this study takes a multi-faceted approach to understanding the link between development activities and university teachers' well-being, in line with Acton and Glasgow (2015) and Onyura et al. (2017). Extant research within and outside of the university context has found that professional development empowers employees by providing both social and institutional support (Tansky and Cohen, 2001; Kraimer et al., 2011; Onyura et al., 2017; Heffernan and Heffernan, 2019). However, little is known to date about how specific teacher professional development activities are related to psychological well-being in the higher education context. Taking a case-study approach, this study aims to investigate how certain professional development activities in formal teacher professional development (e.g., workshops, communities of practice, and reflection) are related to university teachers' well-being at work. The results of this study can inform the design of professional development programs or interventions that focus on the development of both KSAs and well-being of employees, in higher education as well as in other sectors.

Teacher well-being at work

Although there is currently no consensus on the definition of work well-being, a commonly cited source described it as "flourishing employees achieving their full potential for both their own benefit and that of the organization" (see Schulte and Vainio, 2010, p. 423). In the literature, work well-being has been operationalized in various ways, for example, through the absence of ill-being, multidimensional models of well-being, job-related affective well-being, or by measuring work well-being through other related constructs such as job satisfaction, job involvement, work engagement, happiness at work, or organizational commitment (e.g., Page and Vella-Brodrick, 2009; Fischer, 2014; Bermejo-Toro et al., 2016; Branand and Nakamura, 2017). Because we see psychological well-being as the core of employee mental health, our study takes a multidimensional perspective on work well-being based on the model of psychological well-being developed by Ryff and Keyes (1995), and applies this model to the higher education work context.

According to their model of psychological well-being (Ryff and Keyes, 1995), well-being involves six dimensions: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth. (1) The dimension of *self-acceptance* describes people's positive attitude toward themselves, including their positive and their negative qualities. In the context of higher education, this relates to the development of a teacher identity (e.g., Van Lankveld et al., 2017) as well as teachers' perception of themselves as active learners (Ryan and Deci, 2000). (2) The dimension of *positive and trusting relations with others* includes being concerned about and empathetic toward others. Within higher education, teachers have been shown to meet relatedness needs by building positive relationships with students, colleagues, and administrators (Split et al., 2011; Miles et al., 2015). (3) People who score high on the dimension of *autonomy* are described as independent and are able to resist social pressures. Autonomy is "most strongly felt by educators when they are free to make pedagogical decisions, rather than experiencing such decisions as being controlled externally (Averill and Major, 2020, p. 149)." (4) The dimension of *environmental mastery* describes people's sense of competence in managing their environment and their ability to choose or create contexts that suit their needs and values. In higher education, environmental mastery is related to teachers' development of their pedagogical and didactic skills, which provides teachers with the possibility of shaping their work environments inside and outside of the classroom in a way that best suits their strengths and beliefs (e.g., Wallace and Priestley, 2011). (5) *Purpose in life* describes people's sense of directedness in life, where work-related goals create meaning for their life. Teachers' purpose in life can manifest itself in the advancement of their career and in the sense of meaningfulness of their teaching role for student learning (Li, 2018; Rosewell and Ashwin, 2019). (6) Finally, the dimension of *personal growth* describes people having a sense of continued development and being open to new experiences. In higher education, this dimension can, for example, be related to teachers' professional development, innovative work behavior and openness to experimentation (e.g., De Pablos-Pons et al., 2013). In this study, we take into account all six dimensions of well-being in studying their relationship with teacher professional development activities.

Teacher professional development

Teacher professional development in higher education is a continuing process, as teaching takes place in an ill-structured and dynamic environment (Austin et al., 2007; Onyura et al., 2017; Larson et al., 2019). In this process, teachers are seen as life-long learners (Nicholls, 2000; Duţă and Rafailă, 2014) who participate in various activities ranging from formalized programs to informal learning at the workplace (e.g., Butcher and Stoncel, 2012; Gerken et al., 2016). Taking into account the broadness of the concept, teacher professional development can be defined as "a critical review process that allows training practice, contract reviews, learning which problems are faced by teachers, seeking solutions and building knowledge about the learning process" (Duţă and Rafailă, 2014, p. 803). As new university teachers usually do not have any prior teaching experience or educational training, teacher professional development programs, and postgraduate certificates in higher education teaching are common support structures to guarantee a high quality of education for students (e.g., Butcher and Stoncel, 2012; Stewart, 2014). To meet the needs of new teaching staff, these programs usually focus on a variety of teaching-related aspects such as pedagogy, course and curriculum design, student assessment, teacher beliefs, or teacher identity (Burton et al., 2005; Duţă and Rafailă, 2014).

Past research on the effectiveness of professional development programs for teachers in higher education have indeed provided robust evidence for a positive effect on teachers' KSA development (e.g., Norton et al., 2010; Gerken et al., 2016; Phuong et al., 2018). Furthermore, studies by Green et al. (2013) and Nevgi and Löfström (2015) have shown that teacher professional development programs can help to shape academics' teacher identity. In addition, prior research has shown that these programs should include a range of learning activities, such as collaborative and self-reflection, relationship building, feedback and experimentation (Norton et al., 2010; Onyura et al., 2017), as not all professional development activities are equally relevant for all teachers (Norton et al., 2010). Building further on this established link between professional development programs and teachers' KSA development, this study explores the link between a variety of learning activities and teachers' well-being.

Professional development and psychological well-being of university teachers

We build our research question on the relationship between professional development activities and well-being by aligning Ryff and Keyes' (1995) six dimensions of psychological well-being with state-of-the-art research on teacher professional development. First, we identify a series of professional development program outcomes that align with the dimension of *self-acceptance*: increased reflexivity, self-efficacy, and a clearer self-image and a stronger sense of their identity as an educator (Stewart, 2014; Onyura et al., 2017; Fabriz et al., 2021). We therefore expect that participating in a program with such outcomes has the capacity to foster new university teachers' well-being through the dimension of self-acceptance.

Second, the dimension of *positive relations with others* is mirrored in teacher professional development research

through providing social support at work, which by providing networking opportunities creates a feeling of increased social support, and supports forming affiliations for future collaboration (Mathieson, 2011; Onyura et al., 2017). Although many programs still have an individual focus, research has highlighted the benefits of participatory and collaborative learning (e.g., Stes et al., 2007; Warhurst, 2008). We therefore expect that teacher professional development programs can foster well-being when facilitating the making of social connections.

Third, previous research has shown that *autonomy* can be supported through professional development programs – for example, participants reported increased perceived credibility after participation in professional development activities that helped them to "develop a teaching voice in their departments" (Butcher and Stoncel, 2012, p. 156). In addition, studies have shown that professional development programs contribute to the empowerment of academics (e.g., Thorndyke et al., 2006). This link between professional development programs and autonomy further leads us to expect a positive link with well-being.

Fourth, the dimension of *environmental mastery* aligns with teacher professional development research through the development of KSAs, which enables teachers to adapt and innovate their teaching practices and to create a work environment that fits their strengths and beliefs (see Butcher and Stoncel, 2012; Onyura et al., 2017). When the teaching values that participants develop during these programs align with those promoted by their department, transfer from training to practice is likely (Stes et al., 2007), providing a condition for how teacher professional development programs can positively contribute to new teacher well-being.

Fifth, teacher professional development programs can contribute to an increased sense of *purpose in life*, as they can help participants to find meaning in their teaching roles (Onyura et al., 2017). Teachers who can engage in their work with increased passion will likely also experience a sense of purpose (Yukhymenko-Lescroart and Sharma, 2019). Furthermore, teachers in Butcher and Stoncel's (2012) study reported being more engaged in their department's teaching-related discussions after completion of a professional development program. These findings support our view that by creating purpose in life, teacher professional development programs can foster well-being.

Finally, related to the dimension of *personal growth*, participants in past research have often reported a willingness to try new teaching approaches (Butcher and Stoncel, 2012; Stewart, 2014). Stewart (2014) described a shift in participants' view of the professional development activities from a task-oriented to a more meaning-oriented view, which was related to participants' increased self-esteem. In sum, therefore, we expect a positive link between teacher professional development programs and all six facets of psychological well-being.

Overall, the current literature provides a general view of how teacher professional development has the potential to support university teachers' well-being. However, most of the literature has concentrated on how a general teacher professional development program affects teaching performance and student learning. Consequently, these studies provide only limited information about whether and how specific aspects of the program play a role in teachers' psychological well-being. By taking a case study approach, our study therefore aims to explore how specific activities of a teacher professional development program relate to the psychological well-being of new higher education teachers.

The case: A Dutch teacher professional development program

Our study was conducted in the Business and Economics faculty at a mid-sized Dutch university adopting student-centered pedagogy. In the Netherlands, all higher education teaching staff are required to complete a formal teacher professional development program to obtain an official higher education teaching qualification (University Teacher Qualification, UTQ). At all Dutch universities, this UTQ program focuses on the same basic teaching competences related to course and curriculum design, teaching delivery, student assessment, and organization of education. These competences are connected to the course design principles of constructive alignment (Biggs, 1996; Biggs and Tang, 2015), with the goal of ensuring the quality of the educational program. However, all universities tailor this program to the specific needs of their teachers, for example, based on differences in pedagogy. The UTQ program aims to support teachers in the development of teaching KSAs and vision necessary to teach at a university in the Netherlands (see Universiteiten van Nederland, 2022).

In our case study, the professional development program consisted of three phases: self-assessment, competence development, and assessment. The program included various professional development activities connected with the main teaching competences targeted by the program, which involved reflection, interactive workshops, feedback, coaching and a learning community. This case study therefore enabled us to study the link between five types of professional development activity and the six dimensions of psychological well-being, as illustrated in **Figure 1**.

Reflection

Reflection is defined as "the process or means by which an experience, in the form of thought, feeling, or action, is examined to distil its meaning while it is happening or subsequently" (Scott, 2010, p. 432). Through reflection in action, teachers can revisit a sequence of events and the reactions involved; the individual is reflecting on a previous

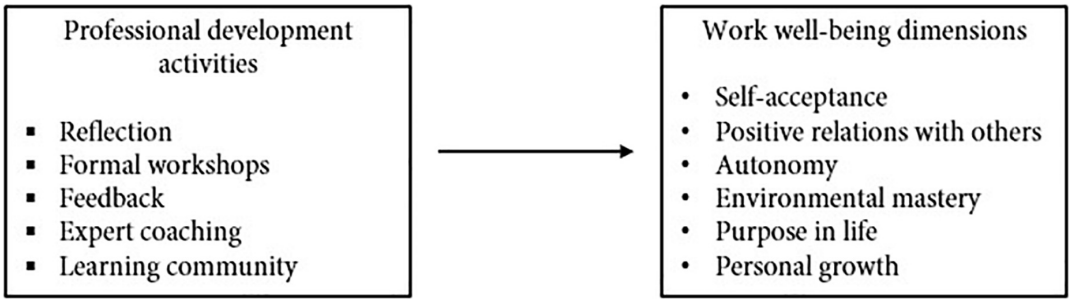


FIGURE 1
Research model.

experience (Yanow and Tsoukas, 2009). In the current case, participants engaged in reflection through self-assessment and a reflective portfolio, which encouraged ongoing reflection while implementing new teaching methods. In the initial phase of the program, participants were asked to reflect on the targeted teaching competences using a self-assessment form. Based on this self-assessment, participants set learning goals for their competence development in the program and drew up an action plan on how to achieve these goals. In the program's competence development phase, participants wrote a reflective portfolio in which they reflected on their course design, teaching practices, student assessment and overall professional development.

Interactive workshops

Workshops within teacher professional development program often focus on pedagogical knowledge or subject-related content knowledge (Mishra and Koehler, 2006), social and affective topics (Taylor and Berry, 2008), communication, conflict management, student motivation (Duţă and Rafailă, 2014), or the exchange of best practices (Taylor and Berry, 2008). The overall goals are to create a style of teaching that is personal, but also aligned with the goals and mission of the university, improve teachers' KSAs and increase teachers' professional confidence (e.g., Hanbury et al., 2008). In the case study at hand, workshops provided participants with the relevant pedagogical knowledge for each target competence. They were highly interactive and focused on the improvement of participants' own courses by setting course objectives, choosing appropriate teaching methods, developing educational materials, student-centered teaching and communication, student formative and summative assessment, peer assessment, and administrative embedding.

Feedback

Feedback is valuable to professionals because it helps them to keep their performance up to or above organizational standards (Sparr and Sonnentag, 2008). This includes both supervisor feedback for role clarity, which helps to enhance competences, reduces uncertainty regarding goal-related behavior, and control (in line with Ilgen et al., 1979; Ashford and Cummings, 1983), and peer feedback for addressing common challenges and learning from each other (Huston and Weaver, 2008). Feedback on teaching behavior can become a valuable informational resource to achieve personal teaching goals (Kluger and DeNisi, 1996), as it relates to both "the appropriate behaviors to achieve a goal (referent information) and how well an individual is enacting those behaviors (appraisal information)" (Ashford and Cummings, 1983, p. 372). In the current case study, informal learning from feedback partially overlapped with formal learning in workshops, as feedback sessions were included in workshop activities. Teachers received peer feedback during the workshops, as well as feedback from an educational expert on their reflective portfolio. Finally, an educational expert observed one of their classes and provided feedback on their teaching behavior.

Expert coaching

Coaching from a more experienced colleague can serve learning, directive, supportive and motivational functions in a professional development program (e.g., Theeboom et al., 2014). Coaching has been shown to influence not only employees' self-conceptions and performance, but also employee well-being, through reducing occupational stress (Grant et al., 2009). In the UTQ program, coaching was provided by educational experts in the context of and beyond workshops whenever the participants needed support or guidance. Coaching was a voluntary activity in the program, and participants could ask for individual coaching whenever necessary.

Learning community

The importance of understanding how teachers work together and share practices is reflected in the large number of studies looking at teacher teams, communities of learning, and peer coaching (Onyura et al., 2017). In higher education, learning communities can foster collaborative work cultures for teachers by promoting and sustaining the learning of teachers with the purpose of enhancing student learning (Vescio et al., 2008). This view assumes that knowledge is

situated in the day-to-day experiences of teachers and best understood through critical reflection with others who share the same experiences (Hairon and Dimmock, 2012). Additionally, professional learning communities also facilitate information sharing and psychological support (Lieberman, 2000). Onyura et al. (2017) found that professional development programs create a platform for the establishment of cross-professional and cross-organizational collegial relationships, which result in support networks and collaborative initiatives. Within the UTQ program, participants were organized in cohorts within faculties. They went through the second program stage together and were expected to collaborate on course design and teaching delivery tasks. During the interactive workshops, an experienced colleague or educational expert leveraged their knowledge with empirical evidence and facilitated the exchange and challenge of beliefs and values. Additional voluntary community activities were provided, such as writing up meetings for the reflective portfolio.

Methodology

Qualitative case study

To answer the research question, a qualitative research approach involving a qualitative case study design was chosen. The qualitative research approach made it possible to study the nature of the relationship between specific formal teacher professional development activities and university teachers' well-being with more depth, taking into account the perceptions of the teachers themselves (Fossey et al., 2002; Merriam and Tisdell, 2016). The chosen case study design allows for the in-depth study of this relationship in the specific context (Meredith, 1998) of the previously described UTQ program as implemented in a specific faculty at a Dutch university. The studied phenomenon is intrinsically bounded (Merriam and Tisdell, 2016) as it is limited to a small number of university teachers participating in the specific implementation of the UTQ program.

Semi-structured interviews

Semi-structured interviews were conducted with university teachers currently participating in the aforementioned teacher professional development program. Semi-structured interviews start with a well-developed set of questions (interview guide) while at the same time leaving sufficient room for participants to add information where necessary [in line with practices of Jackson et al. (2007; see **Table 2**)]. This approach was chosen to allow for deeper insights into participants' perceptions (Jackson et al., 2007) as well as to allow structure and comparability of the findings while also giving freedom to the interviewer and interviewee to explore certain topics in more depth, if desirable (Yin, 2003; Jackson et al., 2007). Through these semi-structured interviews, we could explore in-depth the relationships between the teacher professional development activities and the well-being dimensions.

Sample

In total, 10 university teachers (see **Table 1** for an overview of demographic characteristics) from six different departments within the business and economics faculty voluntarily participated in the interviews. The purposive sampling method was used to select the sample of participants among all the participants of the UTQ program. At the time of the interview, participants had to be either active participants of the UTQ program for at least a year or recent graduates. By applying these sampling criteria, it was possible to ensure that participants had participated in the program long enough to experience all different professional development activities of the program. Four participants identified as female and six participants identified as male. The age of the participants ranged from 28 to 43 years old, with an average age of 32.5 years (SD = 5.04). Furthermore, participants were teaching at the faculty for 3.4 years (SD = 2.58), on average. All participants were untenured junior faculty, for example, PhDs, junior lecturers, and assistant professors, because the teacher professional development program is aimed at new university teachers. Only one participant was a full-time teacher; the other participants had a contracted teaching load of between 20% and 50% of their time.

Data collection procedure

The semi-structured interviews were conducted online, as face-to-face interviews were not feasible due to the COVID-19 pandemic regulations in the Netherland at the time. Participants were contacted *via* email and received a general outline of the study. Before participation, each participant signed an informed consent form agreeing to audio-taping of the interview, the anonymous reporting of findings for research purposes, and acknowledging their right to withdraw from participation at any moment without the need to give a reason. The interviews were conducted in English, the working language for teaching in the chosen faculty. The average interview took 58 min, with a range of between 52 and 69 min. Before the interviews took place, a pilot interview was conducted to test the interview guide.

Interview guideline

The interview guide was based on the theoretical framework and focused on the six dimensions of psychological

TABLE 1 Overview of interviewees' demographics.

Demographics		$N = 10$
Gender identity	Female	6
	Male	4
Age	33–42 years	4
	27–32 years	6
Educational level	Master's	4
	Ph.D.	6
Position	Ph.D. candidate	3
	Lecturer	1
	Post doc researcher	1
	Researcher	1
	Assistant professor	4
Contracted teaching load (% teaching/research distribution)	20/80	4
	40/60	1
	50/50	4
	100/0	1
Years teaching at faculty	1–4 years	7
	5–10 years	3

well-being (Ryff and Keyes, 1995), as well the described teacher professional development activities (based on Norton et al., 2010; Butcher and Stoncel, 2012; März and Kelchtermans, 2013). One or two main questions were asked per topic, followed by additional probes (see **Table 2** for the coding scheme). The questions were open-ended to ensure in-depth discussion of the topics (Hsieh and Shannon, 2005).

Coding procedure

All interviews were transcribed verbatim. The unit of analysis was meaningful segments within the interviewee's response (Flick, 2014). These segments were of different lengths, ranging from part of a sentence to a set of related sentences. Thematic coding was applied to identify segments that were connected by a common theme, allowing for their assignment to categories (Braun and Clarke, 2012). Categories were defined based on the professional development activities of the teacher professional development program and the six dimensions of psychological well-being described by Ryff and Keyes (1995; see **Table 2**). Therefore, the interviews were mainly coded deductively, based on theoretical constructs of interest identified in the theoretical framework. Only one inductive code was added, regarding the role of the teacher professional development program as a whole, instead of focusing on specific teacher professional development activities.

Inter-coder reliability was checked by asking an independent second coder to assess a sample of 10% of meaningful segments (Poortman and Schildkamp, 2012). Any differences in coding were discussed by both coders and recoding was performed where necessary. Krippendorff's c-Alpha Binary index was used to evaluate the inter-coder reliability, as it is applicable for small sample sizes and therefore suitable for our study design, ranging from 1 (perfect agreement) to 0 (perfect disagreement; Krippendorff, 2004; LeBreton and Senter, 2008). In our study, the total agreement coefficient yielded an index of 0.851, a satisfying result according to Krippendorff (2004): "it is customary to require $\alpha \geq 0.800$, where tentative conclusions are still acceptable, $\alpha \geq 0.667$ as the lowest conceivable limit" (p. 429).

Data analysis

Qualitative data analysis software (ATLAS.ti, version 9.1.7.0) was used for the coding and analysis of the data. Directive content analysis was conducted by applying the deductive codes to the interview transcripts (Hsieh and Shannon, 2005). Along with in-depth qualitative analysis of the data, ATLAS.ti was used to conduct co-occurrence analysis between the codes for the six dimensions of psychological well-being on the one hand, and the five professional development activities on the other.

Quality criteria

To increase the reliability and validity of the study, the quality criteria for qualitative research as described by Poortman and Schildkamp (2012) were followed as closely as possible. For example, a research design was chosen that fit the nature of the research question. Furthermore, the interviews were audio taped and analyzed by qualitative data analysis software. Data collection and data analysis were conducted in a structured manner creating a 'chain of evidence.' A clear description of the research steps and sampling strategy was provided. Multiple researchers were involved in the study and a good inter-rater reliability (Krippendorff's c-Alpha Binary index of 0.851) between coders was established. Finally, the findings were interpreted in relation to prior theory.

Results

Using co-occurrence analysis, we explored the link between the six professional development activities of the UTQ program (reflection, interactive workshops, feedback, expert coaching, learning community, and the program overall) and the six dimensions of psychological

TABLE 2 Coding scheme and example interview questions and coded segments.

Category name	Definition	Example interview questions	Example coded segment
Psychological well-being			
Self-acceptance	Possesses a positive attitude toward the self; acknowledges and accepts multiple aspects of self, including good and bad qualities; feels positive about past life (Ryff and Keyes, 1995)	Following the program, how has your perception changed about how you feel about your achievements as a teacher?	"It did help me in making me realize what competences are important as a teacher and that made me even more aware of how I am as a teacher while I was teaching as well. I became more conscious [. . .] and learned to be more vulnerable, to be more authentic."
Personal growth	Has a feeling of continued development, sees self as growing and expanding, is open to new experiences, has sense of realizing his or her potential, sees improvement in self and behavior over time, is changing in ways that reflect more self-knowledge and effectiveness (Ryff and Keyes, 1995).	How do you think the program helped in identifying and setting your own targets for development?	"It showed me that I need to develop myself as a teacher, more in what I do as a teacher, and how I would implement it, how I would act as a teacher, what I need to do as a teacher in order to be effective, I am a little bit more intentional about what I am doing, what I want to achieve, what I can do differently."
Autonomy	Is self-determining and independent, able to resist social pressures, to think and act in certain ways, regulates behavior from within, evaluates self by personal standards (Ryff and Keyes, 1995).	How do you feel due to the program about making your own teaching-related decisions?	"For tips and tricks, all the examples you heard from your peers are now in the back of your mind, where you can each time think is it something that might work for your course or not, there are more options now that are available for you, many more than you individually had at the start."
Purpose in life	Has goals in life and a sense of directedness, feels there is meaning to present and past life, holds beliefs that give life purpose, has aims and objectives for living (Ryff and Keyes, 1995).	How does the program influence your life in terms of thinking about the future as an academic?	"The importance of aligning and matching it up has been made more prominent by the program. The purpose as a teacher, that refers back to the active engagement role, how I evolved and can still evolve on how I can play a role in stimulating students."
Positive relations with others	Has warm, satisfying, trusting relationships with others, is concerned about the welfare of others, is capable of strong empathy, affection, and intimacy, understands the give and take of human relationships (Ryff and Keyes, 1995).	What is the role of the program in how you maintain close work relationships and share your time with colleagues?	"One new colleague participated in one workshop, we kind of talked about how to go about those things. Afterward she said it was very helpful that we discussed this and this. And I asked her if she learned something from this particular period. Like yes, I am going to do this and this next period."
Environmental mastery	Has a sense of mastery and competence in managing the environment, controls a complex array of external activities, makes effective use of surrounding opportunities, able to choose or create contexts suitable to personal needs and values (Ryff and Keyes, 1995).	How has the program played a role in managing the responsibilities of daily work life?	"It really made me think about what is useful, but also how I can use that on a daily basis, it gives me more structure on how I approach teaching or designing a course, in terms of thinking what I have to do, what the steps are, where do I start and what is the end goal, I think that is very helpful, anything that is practical I really enjoyed those and it gives tools, you can directly use the information for courses."
Professional development activities			
The program in general	A learning process, resulting from meaningful interaction between the teacher and the professional context (Kelchtermans, 2009).	–	"A program where you learn to be conscious, you are learning tools to use during class, the didactics. By getting to know peers and sharing experiences you get an insight in how it's done in class by others and how you do that and it also provides a more general overview of how education is built up so the courses do not only ask what is happening in class but also how it is organized."
Reflection	Reflecting in the portfolio on the developed educational materials, the teaching delivered and the feedback, to improve teaching based on these reflections; reflecting on performance as a teacher to continually develop in this role based on these reflections by setting goals (Van de Wiel et al., 2018)	Do you think reflection has changed your perspective and pedagogical approach on teaching and learning?	"Reflection is the starting point and it is the key element of learning to realize that you have to improve or did something great, something that you will keep up in the future, and also to be critical with yourself mostly with the formal process, and evaluation is the most important part."

(Continued)

TABLE 2 Coding scheme and example interview questions and coded segments.

Category name	Definition	Example interview questions	Example coded segment
Formal workshops	Working on one's own courses, improvement of educational materials, conveying knowledge and practicing professional skills; learning to organize and plan the development of educational materials, assessment, administrative embedding, and the finalization of teaching activities (Van de Wiel et al., 2018).	How do you perceive the purpose and effectiveness of the formal workshops?	"Getting some education in how to educate others and how to design education at a higher education level. Thinking about assessment, learning about all the procedures and regulations that come with teaching at a university and specifically at this university, you also learn about [didactic] methods, the cognitive effects of learning on the learners."
Feedback	Can relate to the appropriate behaviors to achieve a goal (referent information) and to how well an individual is enacting those behaviors (appraisal information) (Ashford and Cummings, 1983, p. 372).	Has the feedback given you the tools to review your own professional development needs?	"A couple of workshops I attended where my bachelor course was used as an example and I am quite proud to say this, quite good example as well. People used this as inspiration for their own courses and I received useful questions and feedback afterward."
Expert coaching	Serves learning, directive, supportive and motivational functions in a professional development program as mental support (Ashford and Cummings, 1983).	How do you perceive the purpose and effectiveness of the coaching?	"Giving you advice on things, mainly for you to know, who to contact in certain situations [. . .] from those people I learned a lot in regard to teaching, by asking questions, by discussing the issues I encountered during teaching."
Learning community	Working together with colleagues to develop and coordinate teaching activities, discussing and contributing actively to knowledge exchanges and sharing experiences, learning from each other (Van de Wiel et al., 2018).	What is the role of collegial discussions with peers in the program?	"I think it's more exchanging experiences with other teachers that is useful in some ways, or more how to handle conflict, given that you see other people, because you get various insights or ideas you get that you can then experiment or integrate in your course."

well-being (self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth). Table 3 reports the co-occurrences between these professional development activities and well-being, including overlapping and adjacent codes.

Table 3 provides an overview of the number of participants (*n*) mentioning a co-occurrence, and the number of co-occurrences (*c*) found. The psychological well-being dimensions of environmental mastery ($c = 46$) and personal growth ($c = 43$) were most frequently associated with the teacher professional development activities. The two dimensions of well-being that were least frequently associated with the professional development activities were positive relations with others ($c = 20$) and autonomy ($c = 18$). Comparing the professional development activities, formal workshops ($c = 67$) were associated most often with the dimensions of well-being, followed by learning community ($c = 56$). Both activities, along with the general UTQ program, were the only activities that were associated with all six psychological well-being dimensions. Expert coaching ($c = 13$) and feedback ($c = 12$) were least often associated with the dimensions of psychological well-being. For a visual representation of the co-occurrences between the professional development activities and the six dimensions of work well-being, see Figure 2. We discuss the co-occurrences in more detail for each well-being dimension below.

Self-acceptance

The self-acceptance dimension of psychological well-being at work was most often associated with the professional development activity of *reflection* ($n = 8$, $c = 19$). During the interviews, reflection was described as an activity that gave participants the opportunity to acknowledge and accept both positive and negative aspects of their teaching practices and behaviors, which helped them to create a positive attitude toward themselves: "I think it is a good way to critically look at your own strengths and deficiencies" (Interviewee C). The self-assessment questionnaire at the beginning of the program helped participants to reflect on their teaching practices in a formal way and helped them to realize their tacit teaching practices:

> It showed me that while intuitively I do a lot of things correctly [. . .], it is great in formalizing a lot of the things that you often intuitively do as a teacher, it gives you a clearer explanation of why you do certain things, or why you have to do certain things. (Interviewee B).

Reflection also helped participants to realize what skills they were still lacking: "The first time I reflected on these competences, I realized that this is something I haven't worked on" (Interviewee E).

TABLE 3 Co-occurrence table of the professional development activities and psychological well-being dimensions.

		Professional development activities						
		Reflection	**Formal workshops**	**Feedback**	**Expert coaching**	**Learning community**	**The UTQ program**	**Total**
Work well-being dimensions	Self-acceptance	**8** (19)	**4** (4)	**1** (3)	–	**4** (5)	**1** (1)	32
	Positive relations with others	–	**2** (3)	–	–	**8** (17)	–	20
	Autonomy	–	**3** (4)	**1** (1)	**1** (1)	**5** (9)	**2** (2)	18
	Environmental mastery	**1** (1)	**10** (33)	–	**3** (3)	**5** (7)	**1** (1)	46
	Purpose in life	**4** (7)	**6** (9)	–	**2** (3)	**2** (2)	**5** (12)	33
	Personal growth	**4** (4)	**6** (12)	**5** (5)	**4** (6)	**9** (15)	**2** (2)	43
	Total	31	67	12	13	56	18	

In each cell, the number of participants mentioning a co-occurrence (n) is displayed in bold followed by the number of co-occurrences (c) in brackets. The colors represent the number of participants mentioning a co-occurrences dark gray ($n \geq 5$), light gray ($0 < n < 5$), and white ($n = 0$).

Most other UTQ activities were mentioned less frequently in connection with self-acceptance. The *learning community* was associated with self-acceptance in four interviews ($c = 5$), where participants described that sharing experiences with colleagues helped to create a positive attitude toward themselves, by finding out that they were not the only one struggling with some teaching-related aspects:

> Through discussions, you share a certain issue that you experience [. . .] I don't feel like an imposter anymore [. . .] peers come in to help you to realize that you are not alone, and you are all learning how to become good teachers. (Interviewee B).

Furthermore, seeing different teaching styles in the community helps participants to find and accept their teacher identity: "You feel part of a collective of teachers, even though there are vastly different kind of teachers [. . .] that affected my identity as a teacher" (Interviewee I).

Formal workshops were mentioned four times in connection with an increased self-acceptance ($n = 4$). The participants described how workshops fostered the insight that teaching came naturally for them, but they also confirmed what pedagogical knowledge they still needed to gain. Expert coaching was not associated with self-acceptance.

Feedback was only associated with self-acceptance in one interview ($c = 3$). For example, teachers received feedback from more experienced colleagues in the program, which helped them to acknowledge points for improvement and recognize the positive aspects of their teaching practices, and increased their positive self-perception. One participant described how the overall *UTQ program* ($c = 2$), helps them to gain more trust in themselves: "I now feel more justified about feeling good, because of the UTQ program, I know I did some stuff really well, I can appreciate more if I did a good job, because I know why it is good" (Interviewee C).

Positive relations with others

The well-being dimension of positive relations with others was mainly associated with the *learning community* ($n = 8$, $c = 17$) created within the UTQ program. Going through the program together for a longer period of time helped to foster social connections among the participants. They got to know each other, their teaching practices, their

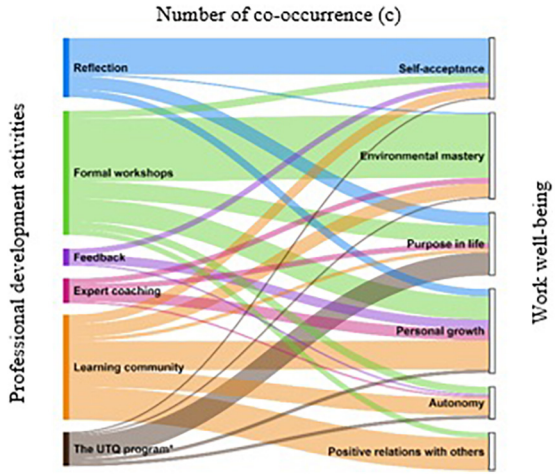


FIGURE 2
Sankey diagram of the number of co-occurrences. *The UTQ program contains all other professional development activities (reflection, formal workshops, feedback, expert coaching, and the learning community).

struggles, and created new connections because of that. The possibility of building relationships with colleagues across various departments with whom you usually do not get into contact was especially highlighted: "Getting to know each other cross-departmentally, you can share research insights, which otherwise wouldn't take place, because this is the only place where you meet" (Interviewee J). These new connections also created opportunities for collaborations beyond the UTQ program itself, on a professional level as well as on a personal level:

> One colleague, we met afterward at the gym and we discovered that we are almost neighbors, it helped socialization in that sense. I met another colleague, we discovered that we have a common interest in research, I was invited to one of his lectures, and I invited him. (Interviewee G).

Additionally, the learning community strengthened already existing relationships.

The exchange of experiences and issues on a deeper level during the *formal workshops* (n = 2, c = 3) helped to create relationships between the participants: "The workshops are great because you learn from each other" (Interviewee B). Likewise, the theoretical frameworks discussed in the workshops provided a base for advanced and empathetic discussions outside of the workshops. Due to the discussions during the workshops, participants started to relate more to their colleagues: "You realize, you have been in the same situation" (Interviewee B).

Feedback, r*eflection*, *expert coaching* and the *UTQ program* in general were not associated with the dimension of positive relations with others.

Autonomy

The well-being dimension of autonomy, although associated with almost all professional development activities, was only occasionally mentioned in the interviews. Autonomy was most often associated with the *learning community* (n = 5, c = 9). The learning community was said to open up room for active discussions supporting the participants in becoming more able to resist social pressures and evaluate whether a teaching method suggested to them actually fit within their course. Furthermore, the learning community encouraged learning from others, while also strengthening self-determination of one's own teaching practices: "I know when people say that teaching is not important, I know for myself it has a certain importance and standing for me that I will put a certain effort into it" (Interviewee B).

Formal workshops (n = 3, c = 4) helped participants gain confidence through increased competence, which also increased their self-determination. In addition, the workshops helped participants to make autonomous decisions: "If I would be a coordinator, I would still follow my own gut, the meeting helped in crystallizing arguments contra and in favor of it, you really in the end learn the pros and cons of it" (Interviewee I).

Participants described how the *UTQ program* as a whole helped them to feel less dependent on others (n = 2, c = 2):

> Due to the UTQ program, I will be better in handling it myself, although you will always have discussions with your peers, in the future I will have to do things myself, now I feel like I am much better prepared to do it by myself as a teacher. (Interviewee B).

The availability and help of *expert coaches* (c = 1) supported one participant in feeling more self-determined and confident, and able to coordinate a course independently. *Feedback* was also only associated once with the dimension of autonomy in connection with the participant's feeling of increased autonomy due to concrete solutions that were discussed regarding the assessment in their course. *Reflection* was not associated with the dimension of autonomy.

Environmental mastery

All 10 participants in the UTQ program associated environmental mastery with the *formal workshops* (c = 33). In general, the workshops supported participants in acquiring important teaching-related knowledge which they needed to effectively design courses and, thereby shape their work environment in a way that is effective for student learning, but also fits their own teaching style and personal needs. The workshops also supported the participants in learning how to collaborate effectively with colleagues, and participants felt responsible for conveying their newly acquired knowledge to their colleagues as well:

> I feel responsible to make sure that [what I learned] from my UTQ courses somehow gets through to them in their tutorials. I am really working on the tutor manual, I have tutor meetings where I tell them they should approach it in this way, the UTQ program is definitely helping me in that process. (Interviewee C).

Moreover, workshops that provided practical information about administration and regulations provided concrete tools to effectively make use of surrounding opportunities. Similarly, the workshops supported participants' efficiency and time management: "It made me more aware of the different roles, how much work and time you can be expecting to put into it, now after the workshops, I am able to assign different amounts of time to those roles" (Interviewee E).

Being part of a *learning community* (n = 5, c = 7) also contributed to participants' environmental mastery through sharing of experiences and ideas. One participant, for example, mentioned that the discussion of specific cases helped them feel prepared to manage a complex array of teaching activities. Discussions with peers also helped participants to learn how to work together effectively with colleagues in a teaching team. By coordinating certain teaching activities with others, another respondent felt able to create contexts suitable to their personal needs and values. For example, they learned how to better organize their teaching teams, especially when working in a large team.

Expert coaching (n = 3, c = 3) helped participants by providing guidance on how to approach certain teaching activities. One participant also mentioned that coaching helped them to support the professional development of one of the tutors they were working with:

> One of my tutors didn't perform well, he scored really badly with students, so I asked the [coach] for a personal meeting to fix and discuss it also with my tutor [. . .] she offered us some solutions, some workshops that my tutors could attend. (Interviewee G).

Moreover, expert coaching also provided mental support, helping to create contexts suitable for the personal needs of this interviewee:

> It also comforts me, that there is such a support system in the form of the [coach] for the UTQ program but also in the form of other colleagues who are providing the workshops and I know that you can easily ask them for advice, help, or feedback. (Interviewee E).

Reflection and the UTQ program in general were both only mentioned once in relation to the dimension of environmental mastery. *Reflection* stimulated the interviewee to evaluate their courses more often and to create contexts such as teaching methods suitable for their personal values and needs. The *UTQ program* in general was associated with increased environmental mastery in relation to the usefulness of the program regarding the management of administrative tasks and regulations. Finally, *feedback* was not associated with environmental mastery.

Purpose in life

The well-being dimension of purpose in life was mainly associated with the *UTQ program* (n = 5, c = 12) in its entirety. Interviewees described how participation in the program had shaped their academic identity: "Being employed at a university, teaching is paramount and makes a big part of why you are there" (Interviewee B). Furthermore, the UTQ program helped the participants to identify themselves as part of a bigger teaching community: "I had a realization moment, it is not only my course, it is part of a whole program, a whole year, a whole faculty" (Interviewee I). In addition, the UTQ program opened up new career opportunities for people, such as a teaching career or a tenured position.

Formal workshops (n = 6, c = 9) contributed to participants' sense of purpose in life by giving direction to their teaching activities and by helping to them to better support student learning. Furthermore, these workshops provided clarity to teachers regarding what is expected of them, and helped them to design their teaching activities accordingly. Finally, participants explained that the workshops helped them to understand the reasoning behind certain teaching practices, helping them to make informed choices to reach their teaching goals: "I feel at least the decisions that I make are not so much from intuition or personal belief, actually I now have more arguments that I can use, based on the program, [. . .] research shows this and this" (Interviewee H).

Reflection (n = 4, c = 7) also contributed to participants' sense of purpose in life. By developing their personal reflective portfolio, participants felt that they were ready to incorporate what they had learned in their future teaching roles. Reflection helped the participants evaluate how the acquired teaching competences contributed to their teaching career. Furthermore, one interviewee mentioned that reflections helped to create meaning and a sense of directedness to continue with their usual teaching practices: "It's like a confirmation [for] the teaching that I did, the way that makes me feel, it makes me so happy, that I want to continue with that" (Interviewee H).

Expert coaching and the learning community were only seldom associated with purpose in life. Participants reported that *expert coaching* (n = 2, c = 3) helped them to set and talk about their goals related to their teaching practice. Furthermore, a coaching meeting at the end of the program was described by a recent graduate as helpful when setting goals for their future professional development as a teacher. The *learning community* (n = 2, c = 2) also helped participants to set teaching goals by creating an opportunity for the participants to share experiences: "Through discussions you just realize that we all face some of the same issues [. . .] through sharing of knowledge you are able to implement it, or think about how you would think about it in the future" (Interviewee B). In addition, the feeling of being part of a community supported respondents in the feeling that there is meaning to their teaching role. *Feedback* was not associated with the dimension of purpose in life.

Personal growth

The well-being dimension of personal growth was most often associated with the learning community as well as the formal workshops in the UTQ program. Almost all interviewees

associated the *learning community* (n = 9, c = 15) with their personal growth as a teacher. Discussing issues and contributing actively toward discussions increased learning from each other and stimulated continual development. Participants described how they improved their teaching methods based on the ideas of others. Furthermore, the exchange with peers helped participants be more open to new experiences:

> A lot of new ideas pop up which makes you immediately more open to thinking and reflecting about those options yourself. Otherwise, you remain stuck in what you have been doing yourself for a while already and you are not really exposed to other things. (Interviewee D).

Several interviewees mentioned that they gained theoretical and practical knowledge during *formal workshops* (n = 6, c = 12) and saw themselves growing and expanding as a teacher over time: "You gain more knowledge on how to put everything into practice, you constantly assess all the things you pick up in the workshops to apply to your own situation, such that you constantly improve your teaching activities" (Interviewee D). Furthermore, participants reported that they had become open to new experiences and saw themselves growing as a result. They were also experimenting more with new teaching and assessment methods: "I am experimenting more with the assessment methods and aligning those, [. . .] the program was very helpful in that" (Interviewee E).

The interviewees mainly mentioned *feedback* (n = 5, c = 5) received from experts and peers during the workshops in association with personal growth. The feedback was followed up and incorporated in order to expand their teaching skills: "One of my colleagues was there [during the tutorial] to give me feedback, [. . .] afterward we had an evaluation about how I could do it differently next time [. . .] this is a critical incident where I learned a lot" (Interviewee H).

Expert coaching (n = 4, c = 6) especially served a directive and learning function for the interviewees, and helped with improving their behavior over time. For example, one teacher received expert coaching when struggling with a specific tutorial group:

> This is not how I would like to have it, and I thought, how can I change that, then I went to the [coach] to ask some tips how to deal with that [. . .] Suddenly, it went really well in that group so that was a really good intervention. (Interviewee H).

Participants also reported that expert coaching helped them to realize their potential. *Reflection* (n = 4, c = 4) helped participants to become more self-critical and see improvement over time. Similarly, another interviewee stated that the reflective portfolio had helped them to gain more insight into what decisions they made and how these helped them to change their behavior over time. The *UTQ program* (n = 2, c = 2) as a whole helped participants to be open to new experiences, displaying a sense of personal growth.

Conclusion and discussion

The aim of this study was to investigate how certain professional development activities in a formal teacher professional development program are related to new university teachers' well-being at work. The results of our case study show an overall link between professional development activities and well-being at work, with specific activities playing a larger role for university teachers' well-being than others.

First, in our case study, the well-being dimension of self-acceptance was mainly related to reflection, with participants emphasizing that reflection helped them acknowledge and build on their strengths and weaknesses as a teacher. In the field of education, reflective practice has previously been linked to a range of outcomes that facilitate self-acceptance, including increased status and self-esteem (Beck and Kosnik, 2001), as well as self-efficacy from reflecting on positive and negative aspects of one's teaching (Yost, 2006). In addition, reflection supports the psychological well-being of academics because they acknowledge a renewed sense of their identity as an educator (März and Kelchtermans, 2013; Onyura et al., 2017). Reflection on past teaching can help teachers to become aware of the structural rules and processes that determine good teaching practices (Kelchtermans, 2009). This study adds that both individual reflection and reflection with peers and educational experts contributes to university teachers' well-being through the dimension of self-acceptance.

Second, the well-being dimension of positive relations with others was most strongly associated with the learning community and the formal workshops in the case study. In both activities, the social aspect of professional development was highlighted by the participants, creating opportunities to connect and discuss with each other during the workshops and other community activities during the program, as well as outside of the scheduled program activities. Prior research has already highlighted the positive effects of participating in a learning community and increased interaction and social support between colleagues (Lieberman, 2000; Onyura et al., 2017). Building on Warhurst (2008), formal workshops can also foster positive relations between colleagues when they create knowledge-sharing opportunities. Formal workshops in combination with a safe and open atmosphere within the learning community, participants are more willing to share an issue or solution. Additionally, increased collegiality and a broadened network can also create opportunities for collaboration outside of the professional development program, and in turn also positively affect academic research. Our findings add the notion that university teachers' well-being is

crucially intertwined with the social dimensions of work, which can be facilitated through professional development programs specifically for new teachers.

Third, the well-being dimension of autonomy is not strongly associated with the professional development activities included in the case study. Based on prior research (e.g., Steinert et al., 2010), we expected that the formal workshops would support the feeling of autonomy in teachers through increased knowledge of pedagogical approaches combined with evidence for best practices, so teachers would feel more self-determined about how they regulated their teaching and how they developed educational materials. However, our results suggest that it was not the formal workshops, but rather the interaction with peers in the learning community that supported the feeling of autonomy. Different opinions expressed by other participants in the UTQ program, as well social dynamics, helped participants to regulate teaching behavior from within. Relating these findings to self-determination theory by Deci and Ryan (2002), the contrasting teaching beliefs discussed by participants in the program may have strengthened teachers' intrinsic motivation to act according to their own teaching beliefs and teaching styles; during the interviews, some teachers expressed that previously, they had often been influenced by the teaching beliefs and practices of senior colleagues, which seemed to set certain departmental norms with regard to teaching. In-depth discussions with peers seem to have strengthened their conviction to resist (some of) these external pressures and act according to their own beliefs, adding to prior research on the link between autonomy, professional development activities, and well-being.

Fourth, formal workshops played the biggest role by far for the well-being dimension of environmental mastery, along with participation in the learning community. We found that formal workshops provide pedagogic tools and structure that support teachers in the ability to control the complex array of teaching activities, in line with findings by Avalos (2011) and Stewart (2014) showing that formal workshops provided clarification and created discussions around teaching policies, practices and administrative procedures. The importance of formal workshops in this study contradicts research stating that formal learning activities are less effective compared to informal learning activities (Kyndt and Baert, 2013), as well as research on the timing of formal workshops that may not align with when teachers need the instruction (Jones and Dexter, 2014). An explanation could be the interactive nature of these workshops in the case setting of the UTQ program, which gave participants the possibility to learn from each other while developing their theoretical knowledge. This synergistic relationship between formal and informal activities was also previously highlighted by Kyndt and Baert (2013). Contrary to prior research findings (e.g., Ilgen et al., 1979; Ashford and Cummings, 1983), feedback was not associated with environmental mastery. In the case setting, interviewees described that they sought and received feedback on specific aspects of their course design and teaching practices, which did not lead to a different use of environmental resources, but rather enhanced their sense of personal growth (see conclusion six below). We conclude that new university teachers' well-being benefits from formal learning when they are afforded social interaction and informal learning within trainings and workshops.

Fifth, based on prior research by Lieberman (2000), we expected that the learning community would play a significant role in the purpose of teachers, as collaboration in networks can unite faculty members, creating a strong sense of shared purpose, and in turn fostering commitment and engagement. However, in our case study, the UTQ program in its entirety was found to play the most significant role in supporting the teachers' purpose. The UTQ certificate itself has a certain standing and status within the university as well as nationally, which provided meaning in the present lives of participants, as well as opening up new career opportunities for teachers, as the certificate is often a requirement for promotion (de Jong et al., 2013). Additionally, the workshops were complementary in supporting this belief. The interviews showed that the program transformed the task-oriented view of teaching of many participants to a meaning-oriented view (Stewart, 2014). Adding to these prior findings, the present study shows that participants can derive well-being through purpose by gaining both a meaning-oriented view and a formal symbol of status at the same time, without one crowding out the other.

Finally, all professional development activities supported the participants' feeling of personal growth. The learning community, formal workshops, and feedback were especially associated with this well-being dimension. Previous studies have shown that professional development programs can lead to positive personal changes in cognitions, beliefs and practice (Stes et al., 2007; Avalos, 2011). Participants in our case study stated that with the knowledge and experience from the formal workshops, they became more open to new experiences and to trying new teaching and assessment methods. This is supported by Butcher and Stoncel (2012), and Stewart (2014), who found sustained personal growth because of a willingness to try new and innovative approaches. Additionally, the results of this study show that personal growth is also supported through discussions in the learning community, woven into the support given in the formal workshops, due to their interactive nature focusing on peer support. Overall, the intellectually challenging environment helped in strengthening interest and energy to recognize their sustained improvement and maturing self-perception as teachers (in line with Onyura et al., 2017). Furthermore, following Locke et al. (1983), role clarity created through workshops and the learning community may have helped to enhance competences and reduce uncertainty regarding goal-related behavior by decreasing uncertainty, leading to feelings of control, as professionals learned which of their decisions led to success and which led to failure. Accordingly, this aligned with teachers' feeling of sustained growth as a result of the program. Feedback also contributed

toward personal growth; however, the perceived fairness of the feedback seems to be crucial, as prior research has shown (Sparr and Sonnentag, 2008). In the current case study, participants focused on feedback on the design and delivery of courses they were currently involved in, leading to hands-on implications and insights. We conclude that teacher well-being is closely related to teachers' personal growth, specifically for beginning teachers, who benefited from the whole range of professional development activities.

In conclusion, teacher professional development programs can play a significant role for teacher well-being in a context of high workload and pressure, when designed with social interaction, learning community, and reflection in mind.

Limitations and recommendations for future research

The present study follows an exploratory case-study approach, offering in-depth information on the relationship between teacher professional development activities and teacher well-being at work. Although our sample consisted of teachers from different departments, the sample size was rather small, calling for future research to study the relationships on a larger scale. Furthermore, we studied one specific teacher professional development program in one specific faculty at a Dutch university, limiting the generalizability of our findings. Conducting a comparative study across different institutes of higher education to account for variability in the design and delivery of professional development activities is therefore a critical next step. Specifically, a closer look needs to be taken at coaching and feedback, as in the current study, the support for psychological well-being from coaching and feedback was not conclusive. Other universities may have integrated feedback and coaching to a greater extent in teacher professional development, resulting in additional insights. Furthermore, the perceived value of certain teacher professional development activities for the work well-being of participants might be dependent on the progress of the participant toward completing the program. Participants might evaluate certain professional development activities as more meaningful toward the end of the program or after completion of the program, compared to earlier stages of the program.

A second limitation concerns the heterogeneity of the interviewees. Their demographic and professional characteristics diverged to the extent that one participant had taught at the university for 9 years, but the average was less than half that (3.4 years). Length of employment seems to influence the perceptions of the usefulness of the professional development program; however, we were not able to further explore this link given the present sample. The results for the formal workshops in particular indicated that newcomers perceived the program as crucial for their professional development, compared to the more negative perceptions of teachers with longer employment. The differences in experience and knowledge were laid bare in the workshops, where certain regulations were new to some, but repetitive for others. It would be interesting to explore how professional development programs can remain relevant for KSAs and well-being for more experienced teachers as well. Further avenues for research should therefore aim to compile a more homogenous sample or focus on a comparative study between teachers with shorter and longer employment.

Third, due to the COVID-19 regulations in the Netherlands at the time of data collection, it was impossible to conduct the interviews in person. Although a video call was sufficient to establish a relationship, there were two interviewees who preferred an audio call only. Additionally, due to weak internet connections, certain questions or answers were repeated, and this detracted from the sincerity of the initial story. Nevertheless, the qualitative research design allowed for deep understanding of the relationship between teacher professional development activities and teacher well-being. Based on our exploratory study, future research should establish causal relationships through large-scale quantitative research.

Implications for practice

The results presented in this study are relevant for educational developers who seek to pay explicit attention toward supporting psychological well-being of teachers. To address well-being, universities should include different types of activities that lead to changes in teachers' professional practice as well as in their thinking about that practice—our study shows that including specific professional development activities in such a program can be effective for targeting specific dimensions of well-being at work.

First, creating possibilities for social exchange between participants is crucial for almost all dimensions of well-being. Creating possibilities for teachers to discuss their teaching experiences and learn from each other can increase their sense of environmental mastery and fosters collegiality. Implementing a learning community for teachers can help them to resist social pressures and become more self-determined in their teaching. The learning community also provides a platform for teachers to approach each other on a deeper level with the collective purpose of enhancing student learning (Vescio et al., 2008). In addition, it can create a sense of shared purpose across departments. Our participants highlighted that this social exchange can be part of both formal and informal development activities, as long as formal workshops are designed with interaction, peer learning, and social connection in mind. Social exchange was furthermore advanced through organizing participants in cohorts, and through a shared start and end point in the program.

Furthermore, new teachers in particular are often struggling with insecurities regarding their teaching role (Morris and Usher, 2011; Butcher and Stoncel, 2012). Creating various possibilities for in-depth reflection on their own teaching practices and beliefs can help teachers to identify improvement points, but also to accept their professional strengths and weaknesses. This self-knowledge facilitates course design and delivery that best fit their teaching style, fostering well-being over time. In addition, in light of the research–teaching nexus, this self-awareness can lead to increased clarity about those roles and the identification of an optimal proportion of teaching activities (Norton et al., 2010). In the current UTQ program, reflection is facilitated and stimulated in three main ways: through structured individual intake, ongoing group reflection combined with theoretical knowledge in the workshops, and a written reflective portfolio that is assessed formatively and summatively by a teaching expert. This portfolio provides a scaffolding structure for reflection through specifying different roles and competences participants develop during the UTQ program, and encourages participants to seek external feedback and to provide examples for more in-depth reflection.

Finally, the importance of a teacher professional development program for teachers' purpose in life depends to a large extent on the importance this program is given within the institution, as well as on a national level. Although most participants in our study seemed to be intrinsically motivated to improve their teaching practices, participation in the program is mandatory, in many cases, for promotion. Even very intrinsically motivated teachers often do not prioritize their professional development in this regard, as departmental expectations conflict with their own academic identity (Van Lankveld et al., 2017). Embedding teacher professional development in institutional performance evaluation practices can help to foster continual teacher professional development. At the same time, the design of teacher professional development programs needs to account for potential trade-offs between intrinsic and extrinsic motivation, regarding both the development of KSAs and well-being. Initiatives to support teacher well-being and teacher professional development initiatives are usually seen as separate from one another, we propose that by designing teacher professional development programs for relatedness (through social relationships and learning communities), autonomy (through interactive workshops and community), and competence (through reflection, workshops, and feedback), new university teachers' well-being can be actively supported.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. The patients/participants provided their written informed consent to participate in this study.

Author contributions

IG: conceptualization. IG and MN: methodology, formal analysis, and investigation. All authors wrote and edited the manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

Acton, R., and Glasgow, P. (2015). Teacher wellbeing in neoliberal contexts: a review of the literature. *Austral. J. Teach. Educ.* 40, 99–114. doi: 10.14221/ajte.2015v40n8.6

Ashford, S. J., and Cummings, L. L. (1983). Feedback as an individual resource: personal strategies of creating information. *Organ. Behav. Hum. Perf.* 32, 370–398. doi: 10.1016/0030-5073(83)90156-3

Austin, A. E., Sorcinelli, M. D., and McDaniels, M. (2007). "Understanding new faculty background, aspirations, challenges, and growth," in *The Scholarship of Teaching and Learning in Higher Education: An Evidence-Based Perspective*, eds R. P. Perry and J. C. Smart (Dordrecht: Springer), 39–89. doi: 10.1007/1-4020-5742-3_4

Avalos, B. (2011). Teacher professional development in teaching and teacher education over ten years. *Teach. Teach. Educ.* 27, 10–20.

Averill, R. M., and Major, J. (2020). What motivates higher education educators to innovate? Exploring competence, autonomy, and relatedness – and connections with wellbeing. *Educ. Res.* 62, 141–161. doi: 10.1080/00131881.2020.1755877

Beck, C., and Kosnik, C. (2001). Reflection-in-action: in defence of thoughtful teaching. *Curric. Inq.* 31, 217–227. doi: 10.1111/0362-6784.00193

Bermejo-Toro, L., Pieto-Ursúla, M., and Hernández, V. (2016). Towards a model of teacher well-being: personal and job resources involved in teacher burnout and engagemenet. *Educ. Psychol.* 36, 481–501. doi: 10.1080/01443410.2015.1005006

Biggs, J. (1996). Enhancing teaching through constructive alignment. *High. Educ.* 32, 347–364. doi: 10.1007/BF00138871

Biggs, J., and Tang, C. (2015). "Constructive alignment: an outcomes-based approach to teaching anatomy," in *Teaching Anatomy: A Practical Guide*, eds L. K. Chand and W. Pawlina (Cham: Springer), 31–38. doi: 10.1007/978-3-319-08930-0_4

Blix, A. G., Cuise, R. J., McBeth Mitchell, B., and Blix, G. G. (1994). Occupational stress among university teachers. *Educ. Res.* 36, 37–41. doi: 10.1080/0013188940360205

Branand, B., and Nakamura, J. (2017). "The well-being of teachers and professors," in *The Wiley Blackwell Handbook of the Psychology of Positivity and Strengths-Based Approaches at Work*, eds L. G. Oades, M. F. Steger, A. D. Fave, and J. Passmore (Chichester: Wiley Blackwell), 466–490. doi: 10.1002/9781118977620.ch24

Braun, V., and Clarke, V. (2012). "Thematic analysis," in *APA Handbook of Research Methods in Psychology, Vol. 2. Research Designs: Quantitative, Qualitative, Neuropsychological, and Biological*, eds H. Cooper, P. M. Camic, D. L. Long, A. T. Panter, D. Rindskopf, and K. J. Sher (Washington, DC: American Psychological Association), 57–71.

Burton, J. P., Bamberry, N. J., and Harris-Boundy, J. (2005). Developing personal teaching efficacy in new teachers in university settings. *Acad. Manag. Learn. Educ.* 4, 160–173. doi: 10.5465/amle.2005.17268563

Butcher, J., and Stoncel, D. (2012). The impact of a postgraduate certificate in teaching in higher education on university lecturers appointed for their professional expertise at a teaching-led university:'It's made me braver'. *Int. J. Acad. Dev.* 17, 149–162. doi: 10.1080/1360144X.2011.620107

Clayton, P., and Ash, S. (2005). Reflection as a key component in faculty development. *Horizon* 13, 161–169. doi: 10.1108/10748120510618187

de Jong, R., Mulder, J., Deneer, P., and van Keulen, H. (2013). Poldering a teaching qualification system in higher education in the Netherlands: a typical Dutch phenomenon. *Rev. Doc. Univ.* 11, 23–40. doi: 10.4995/redu.2013.5517

De Pablos-Pons, J., Colás_Bravo, P., González-Ramírez, T., and Camacho Martínez-Vera, R. (2013). Teacher well-being and innovation with information and communication technologies; proposal for a structural model. *Qual. Quant.* 47, 2755–2767. doi: 10.1007/s11135-012-9686-3

Deci, E. L., and Ryan, R. M. (2002). The "what" and "why" of goal pursuits: human needs and the self-determination of behavior. *Psychol. Inq.* 11, 227–268. doi: 10.1207/S15327965PLI1104_01

Diener, E. (1994). Assessing subjective well-being: progress and opportunities. *Soc. Indic. Res.* 31, 103–157. doi: 10.1007/BF01207052

Duță, N., and Rafailă, E. (2014). Importance of the lifelong learning for professional development of university teachers–needs and practical implications. *Proc. Soc. Behav. Sci.* 127, 801–806. doi: 10.1016/j.sbspro.2014.03.358

Fabriz, S., Hansen, M., Heckman, C., Mordel, J., Mendzheritskaya, J., Stehle, S., et al. (2021). How a professional development programme for university teachers impacts their teaching- related self-efficacy, self-concept, and subjective knowledge. *High. Educ. Res. Dev.* 40, 738–752. doi: 10.1080/07294360.2020.1787957

Fischer, C. (2014). "Conceptualizing and measuring wellbeing at work," in *Wellbeing: A Complete Reference Guide, Volume III, Work Wellbeing*, eds P. Y. Chen and C. Cooper (Chichester: Wiley-Blackwell), 9–35. doi: 10.1002/9781118539415.wbwell018

Flick, U. (2014). *The SAGE Handbook of Qualitative Data Analysis*. London: Sage Publications. doi: 10.4135/9781446282243

Fossey, E., Harvey, C., McDermott, F., and Davidon, L. (2002). Understanding and evaluating qualitative research *. *Austral. N.Z. J. Psychiatr.* 36, 717–732. doi: 10.1046/j.1440-1614.2002.01100.x

Gast, I., Schildkamp, K., and van der Veen, J. T. (2017). Team-based professional development interventions in higher education: a systematic review. *Rev. Educ. Res.* 87, 736–767. doi: 10.3102/0034654317704306

Gerken, M., Beausaert, S., and Segers, M. (2016). Working on professional development of faculty staff in higher education: investigating the relationship between social informal learning activities and employability. *Hum. Resour. Dev. Int.* 19, 135–151. doi: 10.1080/13678868.2015.1116241

Graham, R. (2018). *The Global State of the Art in Engineering Education*. Cambridge, MA: Massachusetts Institute of Technology.

Grant, A. M., Curtayne, L., and Burton, G. (2009). Executive coaching enhances goal attainment, resilience and workplace well-being: a randomised controlled study. *J. Posit. Psychol.* 4, 396–407. doi: 10.1080/17439760902992456

Green, W., Hibbins, R., Houghton, L., and Ruutz, A. (2013). Reviving praxis: stories of continual professional learning and practice architectures in a faculty-based teaching community of practice. *Oxf. Rev. Educ.* 39, 247–266. doi: 10.1080/03054985.2013.791266

Hairon, S., and Dimmock, C. (2012). Singapore schools and professional learning communities: teacher professional development and school leadership in an Asian hierarchical system. *Educ. Rev.* 64, 405–424. doi: 10.1080/00131911.2011.625111

Hanbury, A., Prosser, M., and Rickinson, M. (2008). The differential impact of UK accredited teaching development programmes on academics' approaches to teaching. *Stud. High. Educ.* 33, 469–483. doi: 10.1080/03075070802211844

Heffernan, T. A., and Heffernan, A. (2019). The academic exodus: the role of institutional support in academics leaving universities and the academy. *Prof. Dev. Educ.* 45, 102–113. doi: 10.1080/19415257.2018.1474491

Hsieh, H. F., and Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qual. Health Res.* 15, 1277–1288. doi: 10.1177/1049732305276687

Hubbard, G. T., and Atkins, S. S. (1995). The professor as a person: the role of faculty well-being in faculty development. *Innov. High. Educ.* 20, 117–128. doi: 10.1007/BF01189643

Hubbard, G. T., Atkins, S. S., and Brinko, K. T. (1998). "Holistic faculty development: supporting personal, professional, and organizational well-being," in *To Improve the Academy*, Vol. 17, ed. M. Kaplan (Stillwater, OK: New Fonuns Press and the Professional and Organizational Development Network in Higher Education), 35–50. doi: 10.1002/j.2334-4822.1998.tb00341.x

Huston, T., and Weaver, C. L. (2008). Peer coaching: professional development for experienced faculty. *Innov. High. Educ.* 33, 5–20. doi: 10.1007/s10755-007-9061-9

Ilgen, D. R., Fisher, C. D., and Taylor, M. S. (1979). Consequences of individual feedback on behavior in organizations. *J. Appl. Psychol.* 64, 349–371. doi: 10.1037/0021-9010.64.4.349

Jackson, R. L. II, Drummond, D. K., and Camara, S. (2007). What is qualitative research? *Qual. Res. Rep. Commun.* 8, 21–28. doi: 10.1080/17459430701617879

Jones, W. M., and Dexter, S. (2014). How teachers learn: the roles of formal, informal, and independent learning. *ETR D Educ. Tech. Res.* 62, 367–384. doi: 10.1007/s11423-014-9337-6

Karpavičiūtė, S., and Macijauskienė, J. (2016). The impact of arts activity on nursing staff well-being: an intervention in the workplace. *Int. J. Env. Res. Public Health* 13, 435–451. doi: 10.3390/ijerph13040435

Kelchtermans, G. (2009). Who I am in how I teach is the message: self-understanding, vulnerability and reflection. *Teach. Teach.* 15, 257–272. doi: 10.1080/13540600902875332

Kessels, C. (2010). *The Influence of Induction Programs on Beginning Teachers' Well-Being and Professional Development*. Dissertation. Leiden: University of Leiden.

Kinman, G. (2014). Doing more with less? Work and wellbeing in academics. *Somatechnics* 4, 219–235. doi: 10.3366/soma.2014.0129

Kinman, G., and Johnson, S. (2019). Special section on well-being in academic employees. *Int. J. Stress Manage.* 26, 159–161. doi: 10.1037/str0000131

Kluger, A. N., and DeNisi, A. (1996). The effects of feedback interventions on performance: a historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychol. Bull.* 119, 254–284. doi: 10.1037/0033-2909.119.2.254

Kraimer, M. L., Seibert, S. E., Wayne, S. J., Liden, R. C., and Bravo, J. (2011). Antecedents and outcomes of organizational support for development: the critical role of career opportunities. *J. Appl. Psychol.* 96, 485–500. doi: 10.1037/a0021452

Krippendorff, K. (2004). Reliability in content analysis. *Hum. Commun. Res.* 30, 411–433. doi: 10.1111/j.1468-2958.2004.tb00738.x

Kyndt, E., and Baert, H. (2013). Antecedents of employees' involvement in work-related learning: a systematic review. *Rev. Educ. Res.* 83, 273–313. doi: 10.3102/0034654313478021

Lackritz, J. R. (2004). Exploring burnout among university faculty: incidence, performance, and demographic issues. *Teach. Teach. Educ.* 20, 713–729. doi: 10.1016/j.tate.2004.07.002

Larson, M. L., Seipel, M. T., Shelley, M. C., Gahn, S. W., Ko, S. Y., Schenkenfelder, M., et al. (2019). The academic environment and faculty well-being: the role of psychological needs. *J. Career Assess.* 27, 167–182. doi: 10.1177/1069072717748667

LeBreton, J. M., and Senter, J. L. (2008). Answers to 20 questions about interrater reliability and interrater agreement. *Organ. Res. Methods* 11, 815–852. doi: 10.1177/1094428106296642

Lei, W., Li, J., Li, Y., Castaño, G., Yang, M., and Zou, B. (2021). The boundary conditions under which teaching-research conflict leads to university teachers' job burnout. *Stud. High. Educ.* 46, 406–422. doi: 10.1080/03075079.2020.1811218

Li, Y. (2018). Building well-being among university teachers: the roles of psychological capital and meaning in life. *Eur. J. Work Organ. Psychol.* 27, 594–602. doi: 10.1080/1359432X.2018.1496909

Lieberman, A. (2000). Networks as learning communities: shaping the future of teacher development. *J. Teach. Educ.* 51, 221–227. doi: 10.1177/0022487100051003010

Locke, E. A., Fitzpatrick, W., and White, F. M. (1983). Job satisfaction and role clarity among university and college faculty. *Rev. High. Educ.* 6, 343–365. doi: 10.1353/rhe.1983.0012

März, V., and Kelchtermans, G. (2013). Sense-making and structure in teachers' reception of educational reform. A case study on statistics in the mathematics curriculum. *Teach. Teach. Educ.* 29, 13–24. doi: 10.1016/j.tate.2012.08.004

Mathieson, S. (2011). Developing academic agency through critical reflection: a sociocultural approach to academic induction programmes. *Int. J. Acad. Dev.* 16, 243–256. doi: 10.1080/1360144X.2011.596730

Meredith, J. (1998). Building operations management theory through case and field research. *J. Operations Manag.* 16, 441–454. doi: 10.1016/S0272-6963(98)00023-0

Merriam, S. B., and Tisdell, E. J. (2016). *Qualitative Research - A Guide to Design and Implementation*, 4th Edn. Hoboken, NJ: John Wiley & Sons, Inc.

Miles, M. P., Shepherd, C. D., Rose, J. M., and Dibben, M. (2015). Collegiality in business schools: development of a collegiality measure and evaluations of its implications. *Int. J. Educ. Manag.* 29, 322–333. doi: 10.1108/IJEM-02-2014-0022

Mishra, P., and Koehler, M. J. (2006). Technological pedagogical content knowledge: a framework for teacher knowledge. *Teach. Coll. Rec.* 108, 1017–1054. doi: 10.1111/j.1467-9620.2006.00684.x

Morris, D. B., and Usher, E. L. (2011). Developing teaching self-efficacy in research institutions: a study of award-winning professors. *Contemp. Educ. Psychol.* 36, 232–245. doi: 10.1016/j.cedpsych.2010.10.005

Nevgi, A., and Löfström, E. (2015). The development of academics' teacher identity: enhancing reflection and task perception through a university teacher development programme. *Stud. Educ. Evalu.* 46, 53–60. doi: 10.1016/j.stueduc.2015.01.003

Nicholls, G. (2000). Professional development, teaching, and lifelong learning: the implications for higher education. *Int. J. Lifelong Educ.* 19, 370–377. doi: 10.1080/02601370050110419

Norton, L., Aiyegbayo, O., Harrington, K., Elander, J., and Reddy, P. (2010). New lecturers' beliefs about learning, teaching and assessment in higher education: the role of the PGCLTHE programme. *Innov. Educ. Teach. Int.* 47, 345–356. doi: 10.1080/14703297.2010.518426

Onyura, B., Ng, S. L., Baker, L. R., Lieff, S., Millar, B.-A., and Mori, B. (2017). A mandala of faculty development: using theory-based evaluation to explore contexts, mechanisms and outcomes. *Adv. Health Sci. Educ.* 22, 165–186. doi: 10.1007/s10459-016-9690-9

Page, K. M., and Vella-Brodrick, D. A. (2009). The 'what', 'why', and 'how' of employee well-being: a new model. *Soc. Indic. Res.* 90, 441–458. doi: 10.1007/s11205-008-9270-3

Page, K. M., and Vella-Brodrick, D. A. (2012). The working for wellness program: RCT of an employee well-being intervention. *J. Happiness Stud.* 14, 1007–1031. doi: 10.1007/s10902-012-9366-y

Phuong, T. T., Cole, S. C., and Zarestky, J. (2018). A systematic literature review of faculty development for teacher educators. *High. Educ. Res. Dev.* 37, 373–389. doi: 10.1080/07294360.2017.1351423

Poortman, C. L., and Schildkamp, K. (2012). Alternative quality standards in qualitative research? *Qual. Quan.* 46, 1727–1751. doi: 10.1007/s11135-011-9555-5

Rosewell, K., and Ashwin, P. (2019). Academics' perceptions of what it means to be an academic. *Stud. High. Educ.* 44, 2374–2384. doi: 10.1080/03075079.2018.1499717

Ryan, R. M., and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am. Psychol.* 55, 68–78. doi: 10.1037/0003-066X.55.1.68

Ryff, C. D., and Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *J. Pers. Soc. Psychol.* 69, 719–727. doi: 10.1037/0022-3514.69.4.719

Sabagh, Z., Hall, N. C., and Saroyan, A. (2018). Antecedents, correlates and consequences of faculty burnout. *Educ. Res.* 60, 131–156. doi: 10.1080/00131881.2018.1461573

Salvagioni, D. A. J., Melanda, F. N., Mesas, A. E., González, A. D., Gabani, F. L., and de Andrade, S. M. (2017). Physical, psychological and occupational consequences of job burnout: a systematic review of prospective studies. *PLoS One* 12:e0185781. doi: 10.1371/journal.pone.0185781

Schulte, P., and Vainio, H. (2010). Well-being at work – overview and perspective. *Scand. J. Work Environ. Health* 36, 422–429. doi: 10.5271/sjweh.3076

Scott, S. G. (2010). Enhancing reflection skills through learning portfolios: an empirical test. *J. Manag. Educ.* 34, 430–457. doi: 10.1177/1052562909351144

Shin, J. C., and Jung, J. (2014). Academics job satisfaction and job stress across contries in the changing academic environments. *High. Educ.* 67, 603–620. doi: 10.1007/s10734-013-9668-y

Sparr, J. L., and Sonnentag, S. (2008). Fairness perceptions of supervisor feedback, LMX, and employee well-being at work. *Eur. J. Work Organ. Psychol.* 17, 198–225. doi: 10.1080/13594320701743590

Split, J. L., Koomen, H. M. Y., and Thijs, J. T. (2011). Teacher wellbeing: the importance of teacher-student relationships. *Educ. Psychol. Rev.* 23, 457–477. doi: 10.1007/s10648-011-9170-y

Steinert, Y. (2010). Faculty development: from workshops to communities of practice. *Med. Teach.* 32, 425–428. doi: 10.3109/01421591003677897

Steinert, Y., Macdonald, M. E., Boillat, M., Elizov, M., Meterissian, S., Razack, S., et al. (2010). Faculty development: if you build it, they will come. *Med. Educ.* 44, 900–907. doi: 10.1111/j.1365-2923.2010.03746.x

Stes, A., Clement, M., and Van Petegem, P. (2007). The effectiveness of a faculty training programme: long-term and institutional impact. *Int. J. Acad. Dev.* 12, 99–109. doi: 10.1080/13601440701604898

Stewart, M. (2014). Making sense of a teaching programme for university academics: exploring the longer-term effects. *Teach. Teach. Educ.* 38, 89–98. doi: 10.1016/j.tate.2013.11.006

Tansky, J. W., and Cohen, D. J. (2001). The relationship between organizational support, employee cevelopment, and organizational commitment: an empirical study. *Hum. Resour. Dev. Q.* 12, 285–300. doi: 10.1002/hrdq.15

Taylor, C. T., and Berry, T. M. (2008). A pharmacy faculty academy to foster professional growth and long-term retention of junior faculty members. *Am. J. Pharm. Educ.* 72:32. doi: 10.5688/aj720232

Theeboom, T., Beersma, B., and van Vianen, E. M. (2014). Does coaching work? A meta-analysis on the effects of coaching on individual level outcomes in an organizational context. *J. Posit. Psychol.* 9, 1–18. doi: 10.1080/17439760.2013.837499

Thorndyke, L. E., Gusic, M. E., George, J. J., Quillen, D. A., and Milner, R. J. (2006). Empowering junior faculty: Penn State's faculty development and mentoring program. *Acad. Med.* 81, 668–673. doi: 10.1097/01.ACM.0000232424.88922.df

Universiteiten van Nederland (2022). *Characteristics of the UTQ Scheme as Agreed in 2008*. Available online at: https://www.universiteitenvannederland.nl/en_GB/characteristics-utq-scheme- (accessed January 17, 2022).

Van de Wiel, M., Bijsmans, P., Haelermans, C., Hommes, J., Huveneers, W., and De Rijdt, C. (2018). *University Teaching Qualification 2017 [Brochure]*. Maastricht: Maastricht University.

Van Lankveld, T., Schoonenboom, J., Volman, M., Croiset, G., and Beishuizen, J. (2017). Developing a teacher identity in the university context: a systematic review of the literature. *High. Educ. Res. Dev.* 36, 325–342. doi: 10.1080/07294360.2016.1208154

Vescio, V., Ross, D., and Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teach. Teach. Educ.* 24, 80–91. doi: 10.1016/j.tate.2007.01.004

Virolainen, M. (2007). Workplace learning and higher education in Finland: reflections on current practice. *Educ. Train.* 49, 290–309. doi: 10.1108/00400910710754444

Wallace, C. S., and Priestley, M. (2011). Teacher beliefs and the mediation of curriculum innovation in Scotland: a socio-cultural perspective on professional development and change. *J. Curric. Stud.* 43, 357–381. doi: 10.1080/00220272.2011.563447

Warhurst, R. P. (2008). 'Cigars on the flight-deck': new lecturers' participatory learning within workplace communities of practice. *Stud. High. Educ.* 33, 453–467. doi: 10.1080/03075070802211828

Watts, J., and Robertson, N. (2011). Burnout in university teaching staff: a systematic literature review. *Educ. Res.* 53, 33–50.

Yanow, D., and Tsoukas, H. (2009). What is reflection-in-action? A phenomenological account. *J. Manage. Stud.* 46, 1339–1364. doi: 10.1111/j.1467-6486.2009.00859.x

Yin, R. K. (2003). *Case Study Research - Design and Methods*, 3rd Edn. Thousand Oaks, CA: Sage Publications.

Yost, D. S. (2006). Reflection and self-efficacy: enhancing the retention of qualified teachers from a teacher education perspective. *Teach. Educ. Q.* 33, 59–76.

Yukhymenko-Lescroart, M. A., and Sharma, G. (2019). The relationship Between faculty members' passion for work and well-being. *J. Happiness Stud.* 20, 863–881. doi: 10.1007/s10902-018-9977-z

frontiers | Frontiers in Psychology

TYPE Original Research
PUBLISHED 05 October 2022
DOI 10.3389/fpsyg.2022.920715

Check for updates

OPEN ACCESS

EDITED BY
Simon Beausaert,
Maastricht University, Netherlands

REVIEWED BY
Juan Fraile,
Universidad Francisco de Vitoria, Spain
Charlotte Struyve,
KU Leuven, Belgium

*CORRESPONDENCE
Maedeh Aboutalebi Karkavandi
Maedeh.aboutalebi@unimelb.edu.au

SPECIALTY SECTION
This article was submitted to Organizational Psychology, a section of the journal Frontiers in Psychology

RECEIVED 15 April 2022
ACCEPTED 01 August 2022
PUBLISHED 05 October 2022

CITATION
Aboutalebi Karkavandi M, Gallagher HC, Wang P, Kyndt E, Lusher D, Block K and McKenzie V (2022) School staff wellbeing: A network-based assessment of burnout.
Front. Psychol. 13:920715.
doi: 10.3389/fpsyg.2022.920715

COPYRIGHT
© 2022 Aboutalebi Karkavandi, Gallagher, Wang, Kyndt, Lusher, Block and McKenzie. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

School staff wellbeing: A network-based assessment of burnout

Maedeh Aboutalebi Karkavandi[1,2]*, H. Colin Gallagher[1,2], Peng Wang[2], Eva Kyndt[2], Dean Lusher[2], Karen Block[1] and Vicki McKenzie[3]

[1]Melbourne School of Population and Global Health, University of Melbourne, Melbourne, VIC, Australia, [2]Centre for Transformative Innovation, Swinburne University of Technology, Melbourne, VIC, Australia, [3]Melbourne Graduate School of Education, University of Melbourne, Melbourne, VIC, Australia

Burnout is commonly associated with professions that entail a high rate of close relationships with other individuals or groups. This paper explores the association between burnout and interpersonal relationships using a relational, social network framework. We collected data on advice-seeking relationships among 102 teachers and administrative staff from a secondary school in Melbourne, Australia. Burnout was measured using the Burnout Assessment Tool and we focused on four core subscales: (1) exhaustion; (2) mental distance; (3) emotional impairment; and (4) cognitive impairment. We applied a particular class of statistical model for social networks called Exponential Random Graph Models (ERGMs) to shed new light on how level of burnout relates to formation of advice relations among school staff. Results indicated that high levels of overall burnout were linked to a higher number of advice-seeking ties among school staff. Additionally, teachers who scored high in cognitive impairment (i.e., difficulties in thinking clearly and learn new things at work) tended to seek and to provide advice to a greater number of others. Finally, school staff who scored high in exhaustion (i.e., a severe loss of energy that results in feelings of both physical and mental exhaustion) tended to be sought out less as advisors to others, while those high in mental distance (i.e., psychologically distancing oneself from others) were generally less likely to seek advice from other school staff. We discuss these findings drawing on Conservation of Resource theory. Notably, our results show that burnout is not only an individual-level problem, but that burnout is associated with reduced social connectivity in specific ways that may impact on how other school staff collaborate, culminating in a staff-wide overall impact that affects how schools function.

KEYWORDS

burnout, social networks, teachers, social support, ERGM, brokerage

Introduction

Secondary school teachers are one of the professions that have the highest levels of sick leave due to burnout (García-Carmona et al., 2019). Over the last four decades there has been increasing attention paid to burnout (Sabagh et al., 2018; García-Carmona et al., 2019; Mota et al., 2021). Recently, burnout has been defined as a multidimensional work-related syndrome, indicated by exhaustion, loss of control over emotional and cognitive processes, and mental distancing (Schaufeli et al., 2019).

A wide array of research has defined burnout as a socially induced syndrome (e.g., Bakker et al., 2003; Meredith et al., 2020). Social connectedness to colleagues has long been shown to be an important determinant of burnout, even after controlling for workload (Bakker et al., 2005; Sabagh et al., 2018). What is unknown is how burnout affects interpersonal relationship and how burnout impacts school staff relationships. It is vital to answer this question, given interpersonal relations and specifically advice relations are considered an important organisational resource for learning, sharing information, and joint problem solving (Cross et al., 2001; Lazega et al., 2016). Providing advice to one another allows school staff to mobilise and exchange information, tacit knowledge, and resources (Goddard et al., 2007; Ortega et al., 2020). Consequently, the diffusion of information and knowledge can help them improve their practice, overcome challenges, and achieve their instructional goals (Vescio et al., 2008; Lane and Sweeny, 2018; Ortega et al., 2019).

To date, the literature on teacher advice relationships has overwhelmingly focused on the different opportunities networks offer to individuals because of their predispositions and their position in the network, paying little attention to the ways in which psychological traits such as burnout drive the development of networks (Borgatti and Halgin, 2011; Spillane and Kim, 2012; Siciliano, 2015). Even though it has been widely shown that these psychological traits have an impact on individuals' (social) behaviour (Burt et al., 1998), there is little empirical evidence of on how burnout is linked to advice network structures. A joint investigation of burnout and social network structures may uncover how burnout facilitates or impedes advice seeking among school staff.

We applied an inferential social network approach known as exponential random graph models (ERGMs) to take the actual network structure into account (Lusher et al., 2013). Such models have the potential for evaluating tie formation processes while considering the complex social structure present in real-world interactions. However, these models are seldom applied in educational research (Lusher, 2011; Marion and Schreiber, 2016). Hence, this study's contribution is twofold: from a methodological perspective, we showcased the use of a novel inferential network model in educational research. Subsequently, we provide evidence on the role of burnout in interpersonal relationships while taking the structural dependency of network ties into account.

Theory and hypotheses

Burnout

In a wide range of professions, burnout is currently one of the most studied consequences of stress in the workplace (Childs and Stoeber, 2012). A variety of negative outcomes have been associated with teacher burnout, including absenteeism, high attrition, and poor job performance (Martínez Ramón, 2015; Seth, 2016). Burnout was traditionally viewed as a three-dimensional phenomenon characterised by emotional exhaustion, depersonalisation and cynicism, which were measured by the Maslach Burnout Inventory (MBI) (Schaufeli et al., 2019). However, the MBI conceptualisation, psychometric properties, and practical application have been questioned (Schaufeli et al., 2019). To address this, the Burnout Assessment Tool (BAT) was developed to provide a revised conceptualisation and measurement of burnout in response to the need for updated research on burnout [For a review see Schaufeli et al. (2020)]. Schaufeli et al. (2020) define the burnout concept as both inability and unwillingness to put in effort at work. Based on the BAT operationalisation, burnout is a syndrome comprising four core components as explained by the authors: (1) exhaustion, which is a severe loss of energy accompanied by both physical (tiredness, feeling weak) and mental (feeling drained and worn out) exhaustion; (2) emotional impairment, manifested by intense emotional reactions and feeling overwhelmed by emotions; (3) cognitive impairment, which is characterised by memory problems, attention deficits, and poor cognitive performance; (4) mental distance, which indicates a psychological distance from the work and a strong reluctance or aversion toward it (Schaufeli et al., 2019).

A set of diverse risk factors can lead to chronic stress and subsequent burnout in the educational context. The possible risk factors include high workload, disruptive behaviour of students, lack of support from colleagues and supervisors, insufficient opportunities for training, promotion and professional development, low income, and deficient school and classroom facilities (Cunningham, 1983; Taris et al., 2001; Rodríguez-Mantilla and Fernández-Díaz, 2017). A recent review of antecedents of faculty burnout indicated workload contributed significantly to school staff burnout (Van Droogenbroeck et al., 2014; Sabagh et al., 2018). Furthermore, a higher workload is negatively linked to supportive relationships with colleagues at work (Van Droogenbroeck et al., 2014). Thus, to be able to draw a sound inference about the relationship between burnout and interpersonal relations at work, we controlled for workload in the current study.

Social networks as resource passageways

In the current study, we use a social network framework to investigate the link between burnout and advice network structure. By using a social network approach this study takes the actual network structure into account and goes beyond an intra-individual focus. A social network is defined as a set of actors and the relations among them (Wasserman and Faust, 1994). In the advice network, the actors are individuals and the relations (also termed ties) between them represent advice. A fundamental concept in studies of social networks is the dependency among network ties. This assumption permits a realistic assessment of the social structure. In the current study, we use the Exponential Random Graph Models (ERGM) framework to understand what gives rise to a particular network structure. Exponential Random Graph Models (ERGM), a particular class of statistical model for social networks, is a modelling approach built on the theoretical assumption of dependency in network processes and network structures—that is, social relationships are interdependent and not independent units of analysis (Lusher et al., 2013). In ERGM models, the overall framework includes three categories of tie formation processes: network self-organisation processes, attribute-based processes, and exogenous contextual factors. Network self-organisation processes refer to the process of network ties organising themselves into patterns because the presence of some ties encourages the formation of other ties. For instance, by already being popular, an individual may attract even more network ties (i.e., preferential attachment, or the "rich get richer" in terms of network ties). Exogenous contextual factors processes refer to contextual factors that might affect tie formation (e.g., organisational hierarchy). Finally, the attribute-based process refers to how individual capacities, capabilities and predispositions are related to tie formation.

Burnout and advice networks

Studies of organisations and schools suggest that educators utilise their social networks to inform their practice (Frank et al., 2004; Daly and Finnigan, 2012; Coburn et al., 2013a,b; Meredith et al., 2017). Furthermore, the valuable impact of advice networks has been documented on individual and organisational outcomes, including on wellbeing and job satisfaction (Flap and Völker, 2001; Edinger and Edinger, 2018; Ortega et al., 2020), employee performance at work (Podolny and Baron, 1997; Seibert et al., 2001), and organisational success (Sparrowe et al., 2001; Lazega et al., 2016). However, unlike literature that examines how structural characteristics of advice networks relates to outcomes, studies asking about individual-level antecedents are relatively rare (Nebus, 2006; Lazega et al., 2016).

We use the Conservation of Resources theory (COR) (Hobfoll, 1989) to explain how burnout relates to social network structures. We consider social networks as conduits through which resources are exchanged where actors aim to maximise resources and minimise resource loss (Kalish et al., 2015). Kalish et al. (2015) integrated COR theory with a social network framework when investigating how stress spreads through and shapes networks. The conservation of resources model is widely used to explain behaviour under stressful conditions, often with reference to occupational settings, and is one of the main theories used to understand the antecedents and consequences of burnout (e.g., Neveu, 2007; Halbesleben and Rathert, 2008). Its primary assertion is that people "strive to retain, protect, and build resources and that what is threatening them is the potential or actual loss of these valued resources" (Hobfoll, 1989, p. 516). Resources are described as "objects, states, conditions, and other things that we value" (Hobfoll, 1989, p. 514) and can be material, social and/or energetic. According to COR, actual resource loss, the perceived threat of resource loss or failure to obtain resources after significant use of resources leads to stress (Hobfoll, 1989, 1998). The COR theory has particular relevance here, as it focuses on what are termed as resource passageways where resources flow from or to people (Hobfoll, 2011). Individuals can exchange resources through network ties (e.g., advice relations) where they can identify and exchange resources that are vital for their wellbeing. Thus, a person's network structure can influence the resources to which they have access, which might affect their level of stress and burnout. Further, stress and subsequent burnout experienced by network actors can impact the dynamics of advice ties in the network (Kalish et al., 2015).

Burnout and seeking advice

The literature on the impact of stress and social networks suggests that individuals who suffer from high levels of stress tend to create fewer social connections, while those who experience less stress are more expansive and flexible in forming social connections (Kalish et al., 2015; Aboutalebi Karkavandi et al., 2022). The theoretical account of the relation between stress and forming social ties comes from literature on stress such as the work of Hancock (1989). It suggests that stress is linked with physical and psychological withdrawal and consequently social withdrawal (Repetti, 1992). Additional theoretical support for the effects of stress on forming social relations such as advice-seeking ties comes from COR theory. COR theory posits that individuals need to invest resources to be able to gain new ones (Hobfoll, 2011). Asking for advice from colleagues entails a cost such as fear of rejection, losing face, and showing vulnerability (Bolger et al., 2000; Borgatti and Cross, 2003; Agneessens and Wittek, 2012; Bruk et al., 2018). School staff may seek advice as a way of coping with burnout symptoms, including limited cognitive capacity to handle classroom challenges. Schonfeld (1990, 2001) found that school

staff use advice-seeking as a coping mechanism for job demands and stress. Edinger and Edinger (2018) found that teachers with larger in-school trust networks, and greater embeddedness in advice networks, reported higher job satisfaction. A high level of stress and burnout are highly correlated (Bakker et al., 2001; Boren, 2014), hence we expect to observe the same tendencies (i.e., psychological withdrawal and fear of rejection) in school staff who suffer from burnout. Thus, we argue that school staff with higher levels of burnout are likely to conserve their resources by forming fewer advice-seeking ties.

> *H1. A higher score in burnout is associated with less activity in the class related advice for school staff.*

Burnout and advice giving

We now consider how burnout might relate to being seen as an advice-giver. Stress and burnout theories seldom focus on how the stress and burnout level of others is taken into consideration as external cues that impact interpersonal relationships (Kalish et al., 2015; Aboutalebi Karkavandi et al., 2022). Individuals may be able to assess the burnout level of their colleagues through direct verbal reports of a feeling of burnout (e.g., González-Morales et al., 2012; Meredith et al., 2020) and indirectly, by noticing fatigue, social withdrawal and cynicism (Meredith et al., 2020). Individuals use the information gathered about others' levels of stress to make a decision about the ease of interaction with the other person (i.e., how pleasing the interaction will be) and the value of interaction (e.g., how demanding the advice relation will be) (Kalish et al., 2015). For these two reasons we expect that school staff will be less likely to seek advice from a teacher who exhibits a higher level of burnout symptoms. Advice coming from someone who is tired, withdrawn, and exhibiting poor cognitive performance is likely to be of lower quality and thus not worth the (increased) effort of interacting with that person, who is also likelier to exhibit more intense and less predictable emotional reactions (Kalish et al., 2015). Past studies that looked at the relationship between advice giving and stress indicated that individuals with a higher level of stress are less favourable sources of advice (e.g., Kalish et al., 2015; Aboutalebi Karkavandi et al., 2022). Although the empirical evidence on the relationship between advice giving and burnout is limited, the theoretical argument above allows us to formulate our hypothesis in an exploratory manner. We hypothesise that:

> *H2. A higher score in burnout is associated with less popularity in the classroom-related advice for school staff.*

Homophily and burnout

Past studies have demonstrated that employees with a similar level of burnout tend to form relationships with one another (Bakker et al., 2001, 2003, 2005, 2006; Meredith et al., 2020). This suggests a homophily-based process in which people feel more comfortable forming relations with others who are similar, including similar psychological attributes (McPherson et al., 2001; Robins, 2015). Although a potential explanation for similarity in burnout among co-workers could be the higher workloads in specific groups, Bakker et al. (2005) showed that even after controlling for job autonomy, subjective workload, and objective workload, levels of burnout differed significantly across intensive care units.

Individuals experiencing burnout may prefer one another based on having had similar stressful experiences (Schaefer et al., 2011), and may be a source of positive reinforcement and validation for one another, by virtue of their similar attitudes (Davis, 1981) and emotions (Barsade et al., 2000). Studies of co-rumination had shown that individuals who suffer from stress, and anxiety tend to form bonds based on shared fears and worries where they validate and reinforce the negative feelings about their work environment (Haggard et al., 2011; Boren, 2014). Finally, it is possible that school staff suffering burnout tend to seek advice from one another because they become marginalised in the advice network (Schaefer et al., 2011). As we described above burnout school staff might withdraw from others (H1) and might also not be a popular source of advice for others (H2), hence they might have limited choice of whom they can seek advice from when needed. We hypothesise that:

> *H3. School staff with similar levels of burnout are more likely to seek advice from each other.*

Burnout and brokerage

While previous hypotheses related to giving and receiving advice, burnout may also relate to being an intermediary in the network. In a general sense, a brokerage position (also variously referred to as bridging position, boundary spanning, etc.) refers to a location in the network that links people or groups who are not otherwise directly linked to one another (Long et al., 2013). Individuals in such a position are able to control the flow of information and resources across social space by bridging information gaps ("structural holes"), and coordinating collective efforts (Burt, 1992; Long et al., 2013). Importantly, though, brokers do not simply relay information; they also synthesise it. By virtue of their connection to multiple parts of the network, brokers can pick and choose the best pieces of information from multiple parts of the network, and integrate them into a new perspective (Burt, 2004). In this way, brokerage underpins many essential workplace functions, such as accessing and relaying novel information (e.g., Granovetter, 1973; Burt, 1992; Borgatti and Cross, 2003), learning how to do job tasks (e.g., Brown and Duguid, 1991; Lave and Wenger, 1991), and sharing problem-solving at work (e.g., Weick and Roberts, 1993; Moreland et al., 1996). Literature on knowledge

10.3389/fpsyg.2022.920715

TABLE 1 Exponential random graph model (ERGM) configurations.

Configurations (MPNet labels)	Interpretation
General structural effects	
 Arc	Baseline activity effect controlling for advice network density. Usually not interpreted.
 Reciprocity	The tendency for advice to be reciprocated or exchanged between a pair of nodes
 Popularity spread (AinS)	Positive effect suggests advice are centralised on a few popular advisors
 Activity spread (AoutS)	Positive effect suggests there are a few active advice seekers
 Path closure (AT-T)	Positive effect suggests network path closure result in more efficient advice flow and more cohesive closed structure.
 Multiple-connectivity (A2P-T)	Positive effect suggests the existences of multiple brokerage activities between advice seekers and providers
Actor-relation effects	
 Sender	Positive effects suggest nodes with higher attribute values are more likely to seek advice
 Receiver	Positive effects suggest nodes with higher attribute values are more likely to provide advice
 Homophily	Negative effects suggest nodes with similar attribute values, hence homophily, are more likely to seek advice from one another.
 Brokerage	Positive effects suggest nodes with higher attribute values are more likely to be advice brokers

sharing, in particular, has emphasised the significance of brokers in the facilitation of transfer of knowledge (Lomas, 2007; Penuel et al., 2009; Meyer, 2010; Neal et al., 2015, 2019).

From a COR perspective, the occupational benefits of brokerage may be seen in the development of key job resources. Job resources are "those physical, psychological, social, or organisational aspects of the job that may do any of the following: (a) be functional in achieving work goals; (b) reduce job demands and the associated physiological and psychological costs; (c) stimulate personal growth and development" (Demerouti et al., 2001, p. 501). As a result, a bridging position may buffer against burnout by opening up opportunities for job autonomy and personal development. In turn, the development of these resources may allow the individual to maintain their social position. For example, Cornwell (2009) found that older adults who maintained disconnected personal networks tended to have better physical and cognitive health. This effect is attributed to the cognitive benefit derived from having to coordinate one's social contacts, and negotiate the flow of information back and forth.

Nevertheless, brokerage may be a double-edged sword by increasing social and work demands at the same time that it facilitates professional development. While brokerage has been robustly linked to various indicators of workplace performance (e.g., Burt, 1992, 2005), its relation to wellbeing and related variables presents a much more mixed picture. In work contexts, the impact of brokerage on wellbeing may depend heavily on the content of the network tie, with brokerage in trust networks conferring benefit to wellbeing, but instrumental brokerage coming at a cost to wellbeing [Flap and Völker, 2001; see also Podolny and Baron (1997)]. Likewise, in general social contexts, multiple scholars have found a negative association between brokerage and wellbeing (Bearman and Moody, 2004; Carboni and Gilman, 2012; Lee et al., 2019). While highly embedded individuals face less stress owing to clear and consistent expectations from their (uniform) social group (Haines et al., 2002), brokers may often face multiple sets of social expectations that can be unclear or even at odds (Podolny and Baron, 1997). Therefore, in this study, to understand brokerage as an opportunity for the development of resources, we control for job demands.

Thus, we hypothesise that:

> *H4. Brokerage positions in the advice network will be negatively associated with burnout.*

TABLE 2 Descriptive statistics.

		M	SD	1.	2.	3.	4.	5.	6.	7.
1.	Gender	–	–							
2.	Age	40.98	12.35							
3.	Years of experience at current school	8.34	8.64	−0.05	0.54**					
4.	Workload	1.81	0.69	−0.23	0.06	0.05				
5.	Cognitive impairment	1.87	0.64	−0.06	0.01	−0.20	0.25*			
6.	Emotional impairment	1.64	0.57	0.09	0.24*	−0.07	0.18	0.60**		
7.	Exhaustion	2.68	0.88	−0.04	−0.07	−0.20	0.49**	0.65**	0.50**	
8.	Mental distance	1.81	0.69	−0.10	−0.04	−0.08	0.23*	0.70**	0.51**	0.60**

**$p < 0.01$, *$p < 0.05$.

Methodology

Participants

The participants of this study comprised teachers and administrative staff from one large, metropolitan-area secondary education school within the state of Victoria in Australia with four campuses. The school's four campuses are highly interconnected for three reasons: 1-all campuses are geographically close, 2-they have the same leadership team, and 3-all staff members attend frequent central meetings. Data was collected mid-2021, after a prolonged period of social restrictions owing to COVID-19, including the protracted physical closure of schools in Victoria, and the institution of virtual instruction online. We invited all 140 school staff within the school to participate, with 102 responding to the survey (71% response rate). While the impact of missing data within network research is an enduring issue, this rate is considered an acceptable response rate for network research (Borgatti et al., 2006; Kossinets, 2006). The 102 participants included 63 females (61.8%), 25 males (24.5%), 1 non-binary (1%), and 13 preferred not to provide information about their gender (12.7%). The mean age of the participants was 40.98 years (*SD* = 12.35 years). The school staff average experience at the current school was 8.34 years (*SD* = 8.64 years). The majority of school staff members are teachers (n = 74), the rest are in leadership positions (n = 6), administrative positions (n = 1), and wellbeing support positions (n = 8), and 13 school staff members did not provide details about their roles.

Procedure

Initial contact was made with school leaders. After the principal agreed to participate in the study, they allowed researchers to contact school staff. Participants were invited *via* email to an online meeting delivered *via* the Zoom video conferencing platform. In the online meeting, the researcher explained the research to the participants, provided an opportunity for questions, and invited them to take the survey *via* a secure online survey platform. Those wishing to participate were invited to take the survey at that time. All participants provided their written informed consent to participate in the study. Prior to data collection, this study was reviewed and approved by relevant ethics committees.

Measures

Demographics

School staff were asked about their age, gender, years of experience at current school, and campus. These demographic characteristics were chosen as control variables based on past research on burnout prevalence (e.g., Grayson and Alvarez, 2008; Van Droogenbroeck et al., 2014; Meredith et al., 2020).

Burnout assessment tool

Burnout was measured using the Burnout Assessment Tool (BAT): (Schaufeli et al., 2019). Several studies have shown that BAT is a reliable and valid measure, for instance, a recent study demonstrated that BAT assessed burnout as a syndrome (second-order model) and it is equally represented in samples across six European countries and Japan (de Beer et al., 2020). Additionally, Rasch analyses demonstrated that the items of the BAT functioned well for both Belgium and the Netherlands (Hadžibajramović et al., 2020). We included four core subscales of the BAT: (1) exhaustion, eight items (item example: "Everything I do at work requires a great deal of effort"); (2) mental distance, five items (item example: "I feel a strong aversion toward my job"); (3) emotional impairment, five items (item example: "I do not recognise myself in the way I react emotionally at work."); (4) cognitive impairment, five items (item example: "When I'm working, I have trouble concentrating"). Items were assessed on a 5-point Likert scale ranging from 1 "never" to 5 "always." The Cronbach alpha of the exhaustion, mental distance, emotional impairment, and cognitive impairment subscales were 0.89, 0.72, 0.78, 0.87, respectively.

Quantitative workload inventory

Quantitative Workload Inventory (QWI) was used to determine the amount or quantity of work in a job. The QWI is a nine-item scale assessing how often each statement occurs (item example: "How often does your job require you to work very fast?"). The items are rated on a Likert scale ranging from 1 = less than once per month or never to 5 = several times per day, with a possible score from 5 to 45. High scores represent a high workload. Spector and Jex (1998) reported a good level of internal consistency with an average (coefficient alpha) of 0.82 across 15 studies. The Cronbach alpha for the current study was 0.86.

Network name generators

An advice-seeking network was measured by asking the following question: "Whom do you go to for class-related information." Participants were provided with a roster of names of their co-workers at the school to select from. A matrix constituting the whole network of class-related advice relations among school staff was constructed, where a value of 1 in cell (*i*, *j*) indicated that, ego *i* reported seeking class-related advice from alter j, and a value of 0 indicated otherwise.

Analysis: Exponential random graph models

Social network tie formation was examined using Exponential Random Graph Models (ERGM) for directed networks (Robins et al., 2009). ERGM are statistical models for social network structures, taking into consideration exogenous attributes of nodes or ties (Wasserman and Pattison, 1996; Snijders et al., 2006). ERGM specifications are built on a series of assumptions of conditional dependence among network ties reflecting the interdependent nature of human social activities; that is, the presence of one tie may be dependent on the existence of other ties (Robins et al., 2007; Lusher et al., 2013). ERGMS are multi-theoretical (Monge and Contractor, 2003), allowing for multiple assumptions of interdependence to be examined, each of which pertains to a social exchange principle widely described in social science. Each of these dependencies are represented by the counts of local network configurations, or graph statistics, and their parameters. The models presented in this paper are based on outputs from the MPNet software (Wang et al., 2014) which implements algorithms proposed by Snijders (2002). A more detailed tutorial discussion of ERGM with relation to social psychology may be found in Gallagher and Robins (2015), and a more general introduction to ERGM can be found in Robins et al. (2007).

The list configurations applied in the models for this paper follows the specifications proposed by Robins et al. (2001, 2009). **Table 1** lists these configurations with possible interrelations. The general structural effects control for network endogenous processes, i.e., how existence of one tie may affect other ties, while the actor-relation effects represent how actor attributes affect tie formation. In our models, we focus on the interpretations of BAT related effects directly related to our hypotheses, and present other general structural and other attribute effects as additional findings.

Missing data

A 71% response rate indicates that there was some missing data. Overall, 29% of the school staff's responses were completely missing as we did not have their demographic, burnout, or their own nominations of their social interaction partners (i.e., who they sought advice from) data. However, for these school staff with missing data, we were able to retrieve information on the social ties they were nominated in by other participating respondents. To assess non-response bias, respondents and non-respondents were compared regarding the number of times they were nominated by respondents. We ran a *t*-test on the number of ties both groups received in class-related advice network which revealed no significant difference between respondents and non-respondents, indicating that data were missing at random (MAR). This means that those people who did not complete the survey were not structurally different in network terms (i.e., they were not more isolated or more connected) to those who did complete the survey.

Results

Descriptive statistics

Descriptive statistics of the control and burnout variables are presented in **Table 2**, along with an inter-variable correlation matrix. On a scale of 1–5, school staff scored an average of 1.87 on cognitive impairment, 1.64 on emotional impairment, 2.68 on exhaustion, and 1.81 on mental distance, thus meaning on average, BAT scores can be considered average against the norms developed by Schaufeli et al. (2019). Results also show that the four dimensions of burnout were significantly correlated, with a strong correlation between mental distance and cognitive impairment.

Exponential random graph models results

The overall ERGMs we estimated consist of endogenous network effects and node-level attribute effects. We present two ERGMs (Models A and B) throughout **Tables 3–5** by three sections. Section 1 focuses on effects directly testing our hypotheses. For additional findings, Section 2 contains purely

network endogenous effects, while Section 3 had other node-level attribute effects as controls.

Model A uses the total of the four scores of core symptoms of burnout (exhaustion, mental distance, cognitive impairment, and emotional impairment) as a single aggregated burnout measure. Model B treats the four scores separately, as distinct components (Schaufeli et al., 2019), each of which may affect advice tie formation differently. It is worth noting that Model B only included a brokerage effect for cognitive impairment. Not depicted here is a third model with brokerage effects (Model C) for all core symptoms as presented in the **Supplementary appendix** for comparison. Model B provided as adequate fit as Model C based on model GOF tests, hence Model B is a better parsimonious model. Model C also does not provide additional significant effects, while dampening the otherwise significant cognitive impairment brokerage effect in Model B.

Hypothesised actor-relation effects

In terms of hypothesis 1, we predicted that a higher score in burnout is associated with less advice-seeking. This hypothesis was not supported, in fact, the opposite pattern was found: higher levels of burnout were linked to more advice-seeking ties. To elaborate on more specific mechanisms that may underpin each hypothesis, we tested this hypothesis for each core symptom. There was a positive significant sender effect on advice-seeking for cognitive impairment and a significant and negative sender effect for mental distance. These results suggest that those who suffered from a high level of cognitive impairment (reduced functional capacity to regulate cognitive processes) tend to seek out advice for class-related matters from a higher number of colleagues. On the contrary, school staff who suffer from a high level of mental distance (mental withdrawal and psychological detachment) tend to seek class-related advice from fewer colleagues.

With respect to Hypothesis 2, there were mixed results. We expected that increased burnout would be associated with being sought-after for advice by fewer colleagues. While the overall burnout receiver effect was not significant (Model A), there was a significant, negative receiver effect specifically for exhaustion, indicating school staff who experienced extreme tiredness, severe and serious loss of energy tended to be less popular sources of advice among their colleagues. However, we observed the converse pattern for cognitive impairment; those who reported higher levels of confusion, difficulties in decision making and memory were nominated more often by colleagues as sources of advice.

Regarding hypothesis 3, we expected to observe a homophily effect for burnout, in which school staff with similar levels of burnout favour one another as sources of advice. However, for both overall burnout and for core symptoms, the homophily effect was not significant in either model.

Finally, regarding hypothesis 4, we expected school staff with a higher level of burnout to be less likely to act as a broker in

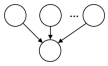
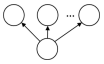
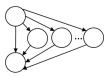
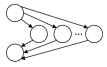
TABLE 3 Actor-relation effects for aggregated burnout score (Model A) and by components (Model B).

			Model A			Model B								
			Aggregated burnout			Cognitive impairment			Emotional impairment			Exhaustion			Mental distance		
Effect	**Configuration**	**Hypothesis**	**Para.**	**S.e.**		**Para.**	**S.e.**		**Para.**	**S.e.**		**Para.**	**S.e.**		**Para.**	**S.e.**	
Sender		H1	0.220	0.053	*	0.412	0.078	*	0.008	0.079		−0.054	0.060		−0.140	0.068	*
Receiver		H2	0.091	0.053		0.301	0.072	*	−0.019	0.068		−0.166	0.065	*	−0.022	0.065	
Homophily		H3	−0.052	0.066		−0.048	0.080		−0.072	0.081		0.014	0.059		0.047	0.080	
Brokerage		H4	−0.031	0.005	*	−0.029	0.006	*									

Statistically significant effects at 0.05 level is indicated by *.

10.3389/fpsyg.2022.920715

TABLE 4 Network endogenous effects.

Effect	Configuration	Model A Para.	Model A S.e.		Model B Para.	Model B S.e.	
Structural effects							
Arc		−5.550	0.436	*	−5.460	0.468	*
Reciprocity		0.928	0.203	*	0.880	0.209	*
Popularity spread (AinS)		0.514	0.136	*	0.509	0.138	*
Activity spread (AoutS)		0.278	0.128	*	0.283	0.138	*
Path closure (AT-T)		1.068	0.072	*	1.027	0.066	*
Multiple-connectivity (A2P-T)		−0.103	0.018	*	−0.109	0.019	*

Statistically significant effects at 0.05 level is indicated by *.

TABLE 5 Other nodal attribute effects as controls.

Effect	Configuration	Model A Para.	Model A S.e.		Model B Para.	Model B S.e.	
Actor-relation effects for workload							
Sender—workload	$Y_i \rightarrow$	−0.001	0.008		0.000	0.008	
Receiver—workload	$\rightarrow Y_i$	0.025	0.007	*	0.033	0.009	*
Homophily—workload	$\lvert Y_i - Y_j \rvert$ $Y_i \rightarrow Y_j$	0.012	0.010		0.010	0.010	
Actor-relation effects for years of experience at the current school							
Sender—years of experience at the current school	$Y_i \rightarrow$	0.002	0.006		0.005	0.006	
Receiver—years of experience at the current school	$\rightarrow Y_i$	0.007	0.005		0.009	0.005	
Homophily—years of experience at the current school	$\lvert Y_i - Y_j \rvert$ $Y_i \rightarrow Y_j$	−0.013	0.006	*	−0.017	0.006	*
Actor-relation effects for age							
Sender—age	$Y_i \rightarrow$	0.001	0.002		0.000	0.002	
Receiver—age	$\rightarrow Y_i$	−0.002	0.002		−0.003	0.002	
Homophily—age	$\lvert Y_i - Y_j \rvert$ $Y_i \rightarrow Y_j$	−0.001	0.003		−0.001	0.003	
Actor-relation effects for gender (male)							
Sender—gender (male)	$Y_i \rightarrow$	0.167	0.078	*	0.141	0.087	
Receiver—gender (male)	$\rightarrow Y_i$	0.081	0.070		0.027	0.079	
Homophily—gender (male)	$Y_i = Y_j$ $Y_i \rightarrow Y_j$	−0.191	0.106		−0.200	0.106	
Homophily—campus	$Y_i = Y_j$ $Y_i \rightarrow Y_j$	0.652	0.071	*	0.671	0.067	*
Homophily—role	$Y_i = Y_j$ $Y_i \rightarrow Y_j$	−0.002	0.087		0.008	0.096	

Statistically significant effects at 0.05 level is indicated by *.

the class-related advice network. In line with our expectation, the parameter estimates for brokerage for total burnout score was negative and significant, indicating that school staff who scored high in the burnout measure, tended not to serve as a unique bridge of advice between their colleagues. This pattern seems to be driven by cognitive impairment specifically. While a model testing brokerage across all four burnout dimensions returned no significant effects, a reduced model (model B) indicated that the parameter estimates for the brokerage for cognitive impairment was negative and significant. This suggests

that school staff who experienced reduced functional capacity to regulate cognitive processes were less likely to connect their colleagues.

Endogenous network processes

We briefly discuss the full network model beyond our hypotheses, to identify wider social processes within the network that are important controls for the abovementioned findings. The network endogenous effects in both Models A and B control for general contextual information about the social system of advice-seeking among school staff within the school environment. We have consistent effects across the two models. Reciprocity effects were positive and significant in both models indicating high levels of mutuality in the advice-seeking network; school staff generally tends to seek advice from those who seek advice from them. Popularity spread effects were positive and significant, indicating a greater than expected variance in popularity. In other words, advice seeking ties are pointed toward a few key advisors. Activity spread effects are also positive and significant indicating some school staff was more active in seeking advice than others. The positive and significant parameter estimate for path closure (AT-T) suggests that network clustering was common in this advice network. Finally, the parameter estimate for multiple connectivity parameter was negative and significant suggesting that relatively few social bridges within the network. In other words, for school staff who are not directly connected to each other in the network, there was a tendency against having multiple, redundant mutual contacts.

Other actor-relation effects

With respect to network-attribute effects, for both Models A and B, there were significant homophily effects for tenure (i.e., years of experience at current school), indicating school staff with similar years of experience tend to seek advice from one another. For Model A, there is a significant and positive sender effect for male, indicating male school staff tends to seek more advice than others. Further, for both models, there were positive and significant receiver effects for workload, which shows that those who scored high in workload measures also tend to be seen as sources of advice in the network. Additionally, the homophily effect for the campus was significant, indicating school staff tend to seek advice from colleagues who work at the same campus.

Discussion

The main aim of this study was to investigate how burnout relates to interpersonal relationships, namely advice-seeking at work for school staff. Our results point to the many ways in which burnout relates to teacher interactions. This study advances the field as there are very few studies that examine the social networks of school staff while taking an inferential social network approach, and teasing apart separate effects for the giving, receiving and brokering of advice. To the best of our knowledge, none of the past studies investigated teacher advice-seeking networks in relation to teacher burnout. Furthermore, we contribute to the field of burnout by testing our hypotheses for a single aggregated burnout measure and the four core symptoms of burnout separately. Our result indicated that four core symptoms of burnout are empirically distinct components and they are associated to advice tie formation differently. This allowed us to understand specific mechanisms that may underpin how each core symptom of burnout might play in interpersonal relationships. Our results point to the specific nature of cognitive impairment symptoms, their unique operation within a social network, and how these may differ from other components of burnout related to emotional and behavioural responses. We discuss the results of the study in terms of burnout core symptoms as follows.

The first core symptom of burnout that we discuss is cognitive impairment, manifested by reduced functional capacity to regulate cognitive processes. Our result showed that school staff who scored high in cognitive impairment, tend to seek and provide advice for class-related matters more than other school staff. As network effects are interdependent (Lusher et al., 2013), when we interpret sender and receiver effects, we must also consider the negative brokerage effect. The brokerage effect indicates that school staff with cognitive impairment are less likely to act as brokers for class-related information, which means that they were less likely to both send and receive a high level of advice. Combining three network effects (sender, receiver, brokerage) suggests that the process for sender and receiver might be separate and we may have two different profiles of the relations between advice network and cognitive impairment.

The first profile includes school staff with high cognitive impairment who rely on the advice of their colleagues to get things done. Perhaps they are seeking a lot of advice because they are overwhelmed, forgetful, and in need of a lot of help and advice. This might be a coping mechanism for burnout school staff who do not have enough cognitive capacity to deal with day-to-day classroom tasks. This result is in line with research that shows that teachers use advice-seeking as a coping mechanism for their job demands and stress (Schonfeld, 1990, 2001; Zhang et al., 2019). School staff who are demonstrating symptoms of burnout have lower cognitive capacity, hence, they might retain less knowledge. A systematic review of association between burnout and cognitive functioning suggested that burnout is linked to specific cognitive deficits (Deligkaris et al., 2014). The review of 15 English-language articles published between 2005 and 2013 revealed burnout to be associated with a decline in three main cognitive functions: executive functions, attention, and memory (Deligkaris et al., 2014).

The second profile includes school staff members who were popular sources of information for others. It is possible

that they feel cognitively exhausted because lots of people are coming to them for advice. Lazega et al. (2006, 2012), studied the evolution of advice ties between judges in a commercial court. They found that network centralisation around an elite group of advisors tended to remain stable and eventually oscillate as central advisors leave or are overloaded. Cross and Thomas (2008) showed that a centralised advice network can lead to a bottleneck where few people are heavily relied on for advice. Those people may experience burnout because they are overloaded with requests for help. They might push harder in the face of endless queries, opportunities, and challenges. Such an imbalance between high job demands and insufficient resources can lead to burnout and specifically cognitive impairment (Schaufeli and Taris, 2014).

Next, our results showed that school staff members with a higher level of cognitive impairment were less likely to act as brokers for class-related information. By virtue of their social position, brokers face cognitive demands to collect and synthesise information into useful messages that can be passed along to others. As a result, only those individuals with certain abilities and skills could occupy this social position (Burt et al., 1998; Long et al., 2013). This finding also aligns specifically with research suggesting that cognitive functioning plays a particular role in pre-empting wider burnout by building up one's job resources (Kulikowski, 2021). In particular, cognitive functioning may allow the individual to craft and maintain a relational environment that supports job tasks and professional development, thereby staving off emotional exhaustion. This study suggests that such a relational environment can be conceptualised and measured as a network environment that is underpinned by brokerage.

This result also has implications above and beyond the level of the individual, suggesting the impact of burnout at the organisational level. The association between burnout and not-brokering indicates that burned out school staff members are reducing the connectivity of the overall advice-seeking network by not filling these brokerage roles. This reduced knowledge sharing has impacts on the school staff as a whole. As such, individual burnout can reduce advice-seeking network connectivity and place a burden on other staff.

Regarding the link between mental distance and advice networks, in line with our expectations, school staff who scored a high level of mental distance (demonstrated by mental withdrawal and psychological detachment from work) seeks advice from a smaller number of their colleagues. Mental distance is a motivational aspect of burnout where individuals are not willing to be engaged with their work (Schaufeli et al., 2019). According to COR, school staff needs to invest resources such as time and energy to be able to gain new ones (Hobfoll, 2011). Those who suffer from mental distance withdraw mentally and physically from their colleagues, hence they have less interest and opportunity to invest in forming advice relations at their work environment. This finding is supported by stress literature in which physical and psychological withdrawal is associated with social withdrawal (Hancock, 1989; Repetti, 1992). Furthermore, this finding is in accordance with results from Kalish et al. (2015) and Aboutalebi Karkavandi et al. (2022) where they find that participants who were experiencing higher levels of stress were less likely to create new network ties.

Regarding the link between exhaustion and advice networks, as expected, school staff who suffered from a higher level of exhaustion were not sought-after sources of advice by their colleagues. Exhaustion shows itself as extreme tiredness and severe and serious loss of energy, these symptoms can act as external cues that affect school staff's interpersonal relationships (Kalish et al., 2015; Aboutalebi Karkavandi et al., 2022). Individuals use the information gathered about their colleagues to make a decision about the ease of interaction with the other person (i.e., how pleasing the interaction will be) and the value of interaction (e.g., how demanding the advice relation will be) (Nebus, 2006). Colleagues of exhausted school staff might find advice relations with them demanding, possibly involving a greater cost and providing lower benefits (Kalish et al., 2015). Hence, it is not surprising that school staff who suffer from exhaustion are not getting asked about class-related information.

Regarding results for emotional impairment, we did not find any significant effects. Our result is similar to a recent study on Finnish university employees (n = 1,463) which showed that a sense of social belonging was not associated with emotional exhaustion (Mäkiniemi et al., 2021). Since it is not always clear to colleagues that someone is emotionally impaired, school staff need to recognise their colleagues' breakdown and signs of emotional impairment before it impacts interpersonal relations. We propose that in the future we need longitudinal data to understand the impact of emotional impairment on advice networks (Burt et al., 1998; Long et al., 2013).

Limitations and further research

First, when interpreting results, it is important to consider the high-stress context for this study, which occurred in the aftermath of the sudden transition to virtual instruction during the COVID-19 pandemic. During this time, school staff faced a drastic and sudden re-configuration of their job demands and were called on to translate instructional content to online platforms, and coordinate adequate resources for individual students (García-Carmona et al., 2019; Răducu and Stănculescu, 2021).

Second, the cross-sectional study nature of the data did not permit us to assess the progression of the interrelation between school staff's burnout and advice-seeking behaviour, nor determine a causal link between burnout and advice network structure. We cannot draw a firm conclusion, for example, whether cognitive impairment leads to more advice seeking, a high level of advice seeking leads to cognitive

impairment, or there is a bi-directional effect between advice seeking and cognitive impairment. Hence, for future work, we recommend examinations of advice networks and burnout at more than one-time point to be able to unpack the causal link between burnout and advice relations. It would be useful to test at the start, middle and end of the school year. In this case, we can unpack further if the link between burnout components and advice seeking and giving behaviour stays the same or changes over time. For instance, we could investigate whether school staff who suffer from a high level of cognitive impairment at the start of the school year and seek and give advice more than average continue to do so, or do they give up on their interpersonal relations by the end of the year?

Third, from a theoretical perspective, the similarity between colleagues could arise because of selection and/or social influence. Longitudinal data would provide an opportunity to untangle selection versus influence effects. We can answer whether school staff select school staff with a similar level of burnout (social selection), or whether colleagues who have frequent interactions become similar overtime because they share their negative feelings and emotions and their relations act as a conduit to pass on the feeling of burnout. Alternatively, both mechanisms may be occurring and, similar to Van Zalk et al. (2011), individuals with burnout tend to choose colleagues who with burnout, and over time they influenced each other to become more burned out.

Conclusion

Taken together, our findings do not suggest that burnout leads to a simple blanket withdrawal from one's participation in a professional setting. Furthermore, it was only for those with increased exhaustion, in particular, that we observe the hypothesised avoidance by colleagues. Instead, burnout is associated with not being in a position to synthesise and relay information from person to person. Combining results regarding brokerage with our results in terms of exhausted staff members being less selected as advisors, we conclude that burnout not only affects individuals suffering from burnout but also reduces the social interaction of others around them. That is, because one teacher is burned out, another teacher does not approach them for advice. Individual burnout thus affects the common pool of resources for advice-seeking. This suggests we need to consider the impacts of burnout beyond the individual in question, and the possibility of cascading effects thereby reducing the capacity for shared leadership and support.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by Swinburne University's Human Research Ethics and the Department of Education and Training Ethics Committees. The patients/participants provided their written informed consent to participate in this study.

Author contributions

MA contributed to the research design, data collection, data analysis, and write up. HG contributed to the research design, data collection, and write up. PW contributed to the data analysis and write up. EK contributed to the research design. DL contributed to the research design and write up. KB and VM contributed to the research design and data collection. All authors contributed to the article and approved the submitted version.

Funding

This work was supported by a Medical Research grant from Teachers Health Foundation.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

Supplementary material

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2022.920715/full#supplementary-material

References

Aboutalebi Karkavandi, M., Wang, P., Lusher, D., Bastian, B., McKenzie, V., and Robins, G. (2022). Perceived friendship network of socially anxious adolescent girls. *Soc. Netw.* 68, 330–345. doi: 10.1016/j.socnet.2021.08.011

Agneessens, F., and Wittek, R. (2012). Where do intra-organizational advice relations come from? The role of informal status and social capital in social exchange. *Soc. Netw.* 34, 333–345. doi: 10.1016/j.socnet.2011.04.002

Bakker, A. B., Demerouti, E., and Schaufeli, W. B. (2003). The socially induced burnout model. *Lead. Edge Res. Cogn. Psychol.* 25, 45–62.

Bakker, A. B., Emmerik, H. V., and Euwema, M. C. (2006). Crossover of burnout and engagement in work teams. *Work Occup.* 33, 464–489. doi: 10.1177/0730888406291310

Bakker, A. B., Le Blanc, P. M., and Schaufeli, W. B. (2005). Burnout contagion among intensive care nurses. *J. Adv. Nurs.* 51, 276–287. doi: 10.1111/j.1365-2648.2005.03494.x

Bakker, A. B., Schaufeli, W. B., Sixma, H. J., and Bosveld, W. (2001). Burnout contagion among general practitioners. *J. Soc. Clin. Psychol.* 20, 82–98.

Barsade, S. G., Ward, A. J., Turner, J. D., and Sonnenfeld, J. A. (2000). To your heart's content: A model of affective diversity in top management teams. *Adm. Sci. Q.* 45, 802–836. doi: 10.2307/2667020

Bearman, P. S., and Moody, J. (2004). Suicide and friendships among American adolescents. *Am. J. Public Health* 94, 89–95. doi: 10.2105/AJPH.94.1.89

Bolger, N., Zuckerman, A., and Kessler, R. C. (2000). Invisible support and adjustment to stress. *J. Pers. Soc. Psychol.* 79, 953–961. doi: 10.1037/0022-3514.79.6.953

Boren, J. P. (2014). The relationships between co-rumination, social support, stress, and burnout among working adults. *Manag. Commun. Q.* 28, 3–25. doi: 10.1177/0893318913509283

Borgatti, S. P., Carley, K. M., and Krackhardt, D. (2006). On the robustness of centrality measures under conditions of imperfect data. *Soc. Netw.* 28, 124–136.

Borgatti, S. P., and Cross, R. (2003). A relational view of information seeking and learning in social networks. *Manag. Sci.* 49, 432–445. doi: 10.1016/j.socnet.2005.05.001

Borgatti, S. P., and Halgin, D. S. (2011). On network theory. *Organ. Sci.* 22, 1168–1181. doi: 10.1287/orsc.1100.0641

Brown, J. S., and Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organ. Sci.* 2, 40–57. doi: 10.1287/orsc.2.1.40

Bruk, A., Scholl, S. G., and Bless, H. (2018). Beautiful mess effect: Self–other differences in evaluation of showing vulnerability. *J. Pers. Soc. Psychol.* 115, 192–205. doi: 10.1037/pspa0000120

Burt, R. S. (1992). *Structural holes*. Cambridge, MA: Harvard University Press.

Burt, R. S. (2004). Structural holes and good ideas. *Am. J. Sociol.* 110, 349–399. doi: 10.1086/421787

Burt, R. S. (2005). *Brokerage and closure: An introduction to social capital*. Oxford: OUP.

Burt, R. S., Jannotta, J. E., and Mahoney, J. T. (1998). Personality correlates of structural holes. *Soc. Netw.* 20, 63–87. doi: 10.1016/S0378-8733(97)00005-1

Carboni, I., and Gilman, R. (2012). Brokers at risk: Gender differences in the effects of structural position on social stress and life satisfaction. *Group Dyn.* 16, 218–230. doi: 10.1037/a0028753

Childs, J. H., and Stoeber, J. (2012). Do you want me to be perfect? Two longitudinal studies on socially prescribed perfectionism, stress and burnout in the workplace. *Work Stress* 26, 347–364. doi: 10.1080/02678373.2012.737547

Coburn, C. E., Mata, W. S., and Choi, L. (2013a). The embeddedness of teachers' social networks: Evidence from a study of mathematics reform. *Sociol. Educ.* 86, 311–342. doi: 10.1177/0038040713501147

Coburn, C. E., Penuel, W. R., and Geil, K. E. (2013b). *Practice partnerships: A strategy for leveraging research for educational improvement in school districts*. New York, NY: William T. Grant Foundation.

Cornwell, B. (2009). Good health and the bridging of structural holes. *Soc. Netw.* 31, 92–103. doi: 10.1016/j.socnet.2008.10.005

Cross, R., Borgatti, S. P., and Parker, A. (2001). Beyond answers: Dimensions of the advice network. *Soc. Netw.* 23, 215–235. doi: 10.1016/S0378-8733(01)00041-7

Cross, R. L., and Thomas, R. J. (2008). *Driving results through social networks: How top organizations leverage networks for performance and growth*. Hoboken, NJ: John Wiley & Sons.

Cunningham, W. G. (1983). Teacher burnout—Solutions for the 1980s: A review of the literature. *Urban Rev.* 15, 37–51. doi: 10.1007/BF01112341

Daly, A. J., and Finnigan, K. S. (2012). Exploring the space between: Social networks, trust, and urban school district leaders. *J. Sch. Leadersh.* 22, 493–530. doi: 10.1177/105268461202200304

Davis, D. (1981). Implications for interaction versus effectance as mediators of the similarity-attraction relationship. *J. Exp. Soc. Psychol.* 17, 96–117. doi: 10.1016/0022-1031(81)90009-3

de Beer, L. T., Schaufeli, W. B., De Witte, H., Hakanen, J. J., Shimazu, A., Glaser, J., et al. (2020). Measurement invariance of the Burnout Assessment Tool (BAT) across seven cross-national representative samples. *Int. J. Environ. Res. Public Health* 17:5604. doi: 10.3390/ijerph17155604

Deligkaris, P., Panagopoulou, E., Montgomery, A. J., and Masoura, E. (2014). Job burnout and cognitive functioning: A systematic review. *Work Stress* 28, 107–123. doi: 10.1080/02678373.2014.909545

Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. (2001). The job demands-resources model of burnout. *J. Appl. Psychol.* 86, 499–512. doi: 10.1037/0021-9010.86.3.499

Edinger, S. K., and Edinger, M. J. (2018). Improving teacher job satisfaction: The roles of social capital, teacher efficacy, and support. *J. Psychol.* 152, 573–593. doi: 10.1080/00223980.2018.1489364

Flap, H., and Völker, B. (2001). Goal specific social capital and job satisfaction: Effects of different types of networks on instrumental and social aspects of work. *Soc. Netw.* 23, 297–320. doi: 10.1016/S0378-8733(01)00044-2

Frank, K. A., Zhao, Y., and Borman, K. (2004). Social capital and the diffusion of innovations within organizations: The case of computer technology in schools. *Sociol. Educ.* 77, 148–171. doi: 10.1177/003804070407700203

Gallagher, H. C., and Robins, G. (2015). Network statistical models for language learning contexts: Exponential random graph models and willingness to communicate. *Lang. Learn.* 65, 929–962. doi: 10.1111/lang.12130

García-Carmona, M., Marín, M. D., and Aguayo, R. (2019). Burnout syndrome in secondary school teachers: A systematic review and meta-analysis. *Soc. Psychol. Educ.* 22, 189–208. doi: 10.1007/s11218-018-9471-9

Goddard, Y. L., Goddard, R. D., and Tschannen-Moran, M. (2007). A theoretical and empirical investigation of teacher collaboration for school improvement and student achievement in public elementary schools. *Teach. Coll. Rec.* 109, 877–896. doi: 10.1177/016146810710900401

González-Morales, M. G., Peiró, J. M., Rodríguez, I., and Bliese, P. D. (2012). Perceived collective burnout: A multilevel explanation of burnout. *Anxiety Stress Coping* 25, 43–61. doi: 10.1080/10615806.2010.542808

Granovetter, M. S. (1973). The strength of weak ties. *Am. J. Sociol.* 78, 1360–1380. doi: 10.1086/225469

Grayson, J. L., and Alvarez, H. K. (2008). School climate factors relating to teacher burnout: A mediator model. *Teach. Teach. Educ.* 24, 1349–1363. doi: 10.1016/j.tate.2007.06.005

Hadžibajramović, E., Schaufeli, W., and De Witte, H. (2020). A Rasch analysis of the burnout assessment tool (BAT). *PLoS One* 15:e0242241. doi: 10.1371/journal.pone.0242241

Haggard, D. L., Robert, C., and Rose, A. J. (2011). Co-rumination in the workplace: Adjustment trade-offs for men and women who engage in excessive discussions of workplace problems. *J. Bus. Psychol.* 26, 27–40. doi: 10.1007/s10869-010-9169-2

Haines, V. A., Beggs, J. J., and Hurlbert, J. S. (2002). "Exploring the structural contexts of the support process: Social networks, social statuses, social support, and psychological distress," in *Social networks and health*, eds J. A. Levy and B. A. Pescosolido (Bingley: Emerald Group Publishing Limited), 269–292. doi: 10.1016/S1057-6290(02)80030-4

Halbesleben, J. R., and Rathert, C. (2008). Linking physician burnout and patient outcomes: Exploring the dyadic relationship between physicians and patients. *Health Care Manag. Rev.* 33, 29–39. doi: 10.1097/01.HMR.0000304493.87898.72

Hancock, P. A. (1989). A dynamic model of stress and sustained attention. *Hum. Fact.* 31, 519–537. doi: 10.1177/001872088903100503

Hobfoll, S. (1989). Conservation of resources American psychologist. *Am. Psychol.* 44, 513–524. doi: 10.1037/0003-066X.44.3.513

Hobfoll, S. (1998). *Stress, culture, and community: The psychology and philosophy of stress*. New York, NY: Springer.

Hobfoll, S. E. (2011). Conservation of resource caravans and engaged settings. *J. Occup. Organ. Psychol.* 84, 116–122. doi: 10.1111/j.2044-8325.2010.02016.x

Kalish, Y., Luria, G., Toker, S., and Westman, M. (2015). Till stress do us part: On the interplay between perceived stress and communication network dynamics. *J. Appl. Psychol.* 100, 1737–1751. doi: 10.1037/apl0000023

Kossinets, G. (2006). Effects of missing data in social networks. *Soc. Netw.* 28, 247–268. doi: 10.1016/j.socnet.2005.07.002

Kulikowski, K. (2021). Cognitive abilities-a new direction in burnout research. *Eur. J. Work Organ. Psychol.* 30, 705–719. doi: 10.1080/1359432X.2020.1841284

Lane, J. L., and Sweeny, S. P. (2018). Colleagues, challenges, and help provision: How early career teachers construct their social networks to help them with the endemic challenges of teaching. *Elem. Sch. J.* 119, 73–98. doi: 10.1086/698605

Lave, J., and Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.

Lazega, E., Bar-Hen, A., Barbillon, P., and Donnet, S. (2016). Effects of competition on collective learning in advice networks. *Soc. Netw.* 47, 1–14. doi: 10.1016/j.socnet.2016.04.001

Lazega, E., Lemercier, C., and Mounier, U. (2006). A spinning top model of formal organization and informal behavior: Dynamics of advice networks among judges in a commercial court. *Eur. Manag. Rev.* 3, 113–122. doi: 10.1057/palgrave.emr.1500058

Lazega, E., Mounier, L., Snijders, T., and Tubaro, P. (2012). Norms, status and the dynamics of advice networks: A case study. *Soc. Netw.* 34, 323–332. doi: 10.1016/j.socnet.2009.12.001

Lee, Y., HeeJung, J., and Casciaro, T. (2019). *The mind of the network broker*. Available online at: https://ssrn.com/abstract=3512396 (accessed December 2, 2019).

Lomas, J. (2007). The in-between world of knowledge brokering. *BMJ* 334, 129–132. doi: 10.1136/bmj.39038.593380.AE

Long, J. C., Cunningham, F. C., and Braithwaite, J. (2013). Bridges, brokers and boundary spanners in collaborative networks: A systematic review. *BMC Health Serv. Res.* 13:158. doi: 10.1186/1472-6963-13-158

Lusher, D. (2011). Masculinity, educational achievement and social status: A social network analysis. *Gend. Educ.* 23, 655–675. doi: 10.1080/09540253.2010.527825

Lusher, D., Koskinen, J., and Robins, G. (2013). *Exponential random graph models for social networks: Theory, methods, and applications*, Vol. 35. Cambridge: Cambridge University Press.

Mäkiniemi, J.-P., Oksanen, A., and Mäkikangas, A. (2021). Loneliness and well-being during the COVID-19 pandemic: The moderating roles of personal, social and organizational resources on perceived stress and exhaustion among Finnish university employees. *Int. J. Environ. Res. Public Health* 18:7146. doi: 10.3390/ijerph18137146

Marion, R., and Schreiber, C. (2016). "Evaluating complex educational systems with quadratic assignment problem and exponential random graph model methods," in *Complex dynamical systems in education*, eds M. Koopmans and D. Stamovlasis (Cham: Springer), 177–201. doi: 10.1007/978-3-319-27577-2_10

Martínez Ramón, J. P. (2015). Cómo se defiende el profesorado de secundaria del estrés: Burnout y estrategias de afrontamiento. *Rev. Psicol. Trab. Organ.* 31, 1–9. doi: 10.1016/j.rpto.2015.02.001

McPherson, M., Smith-Lovin, L., and Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annu. Rev. Sociol.* 27, 415–444. doi: 10.1146/annurev.soc.27.1.415

Meredith, C., Schaufeli, W., Struyve, C., Vandecandelaere, M., Gielen, S., and Kyndt, E. (2020). 'Burnout contagion'among teachers: A social network approach. *J. Occup. Organ. Psychol.* 93, 328–352. doi: 10.1111/joop.12296

Meredith, C., Van den Noortgate, W., Struyve, C., Gielen, S., and Kyndt, E. (2017). Information seeking in secondary schools: A multilevel network approach. *Soc. Netw.* 50, 35–45. doi: 10.1016/j.socnet.2017.03.006

Meyer, M. (2010). The rise of the knowledge broker. *Sci. Commun.* 32, 118–127. doi: 10.1177/1075547009359797

Monge, P. R., and Contractor, N. (2003). *Homophily, proximity, and social support theories. In Theories of communication networks*. Oxford: Oxford University Press. doi: 10.1093/oso/9780195160369.003.0015

Moreland, R. L., Argote, L., and Krishnan, R. (1996). "Socially shared cognition at work: Transactive memory and group performance," in *What's so social about social cognition?: Social cognition research in small groups*, eds J. L. Nye and A. M. Brower (Thousand Oaks, CA: Sage), 57–84. doi: 10.4135/9781483327648.n3

Mota, A. I., Lopes, J., and Oliveira, C. (2021). Burnout in portuguese teachers: A systematic review. *Eur. J. Educ. Res.* 10, 693–703. doi: 10.12973/eu-jer.10.2.693

Neal, J. W., Neal, Z. P., Kornbluh, M., Mills, K. J., and Lawlor, J. A. (2015). Brokering the research–practice gap: A typology. *Am. J. Commun. Psychol.* 56, 422–435. doi: 10.1007/s10464-015-9745-8

Neal, J. W., Neal, Z. P., Mills, K. J., Lawlor, J. A., and McAlindon, K. (2019). What types of brokerage bridge the research-practice gap? The case of public school educators. *Soc. Netw.* 59, 41–49. doi: 10.1016/j.socnet.2019.05.006

Nebus, J. (2006). Building collegial information networks: A theory of advice network generation. *Acad. Manag. Rev.* 31, 615–637. doi: 10.5465/amr.2006.21318921

Neveu, J. P. (2007). Jailed resources: Conservation of resources theory as applied to burnout among prison guards. *J. Organ. Behav* 28, 21–42. doi: 10.1002/job.393

Ortega, L., Boda, Z., Thompson, I., and Daniels, H. (2020). Understanding the structure of school staff advice relations: An inferential social network perspective. *Int. J. Educ. Res.* 99:101517. doi: 10.1016/j.ijer.2019.101517

Ortega, L., Thompson, I., and Daniels, H. (2019). School staff advice-seeking patterns regarding support for vulnerable students. *J. Educ. Adm.* 58, 151–170. doi: 10.1108/JEA-12-2018-0236

Penuel, W., Riel, M., Krause, A., and Frank, K. (2009). Analyzing teachers' professional interactions in a school as social capital: A social network approach. *Teach. Coll. Rec.* 111, 124–163. doi: 10.1177/016146810911100102

Podolny, J. M., and Baron, J. N. (1997). Resources and relationships: Social networks and mobility in the workplace. *Am. Sociol. Rev.* 62, 673–693. doi: 10.2307/2657354

Răducu, C.-M., and Stănculescu, E. (2021). Protective factors and teachers' risk to burnout during the Covid-19 Pandemic. Do kolb's educator roles matter?-A cluster analysis. *Preprints* 2021:2021080053. doi: 10.20944/preprints202108.0053.v1

Repetti, R. L. (1992). "Social withdrawal as a short-term coping response to daily stressors," in *Hostility, coping, & health*, ed. H. S. Friedman (Washington, DC: American Psychological Association), 151–165. doi: 10.1037/10105-011

Robins, G. (2015). *Doing social network research: Network-based research design for social scientists*. Thousand Oaks, CA: Sage.

Robins, G., Elliott, P., and Pattison, P. (2001). Network models for social selection processes. *Soc. Netw.* 23, 1–30. doi: 10.1016/S0378-8733(01)00029-6

Robins, G., Pattison, P., Kalish, Y., and Lusher, D. (2007). An introduction to exponential random graph (p*) models for social networks. *Soc. Netw.* 29, 173–191. doi: 10.1016/j.socnet.2006.08.002

Robins, G., Pattison, P., and Wang, P. (2009). Closure, connectivity and degree distributions: Exponential random graph (p*) models for directed social networks. *Soc. Netw.* 31, 105–117. doi: 10.1016/j.socnet.2008.10.006

Rodríguez-Mantilla, J. M., and Fernández-Díaz, M. J. (2017). The effect of interpersonal relationships on burnout syndrome in Secondary Education teachers. *Psicothema* 29, 370–377. doi: 10.7334/psicothema2016.309

Sabagh, Z., Hall, N. C., and Saroyan, A. (2018). Antecedents, correlates and consequences of faculty burnout. *Educ. Res.* 60, 131–156. doi: 10.1080/00131881.2018.1461573

Schaefer, D. R., Kornienko, O., and Fox, A. M. (2011). Misery does not love company: Network selection mechanisms and depression homophily. *Am. Sociol. Rev.* 76, 764–785. doi: 10.1177/0003122411420813

Schaufeli, W. B., and Taris, T. W. (2014). "A critical review of the job demands-resources model: Implications for improving work and health," in *Bridging occupational, organizational and public health*, eds G. F. Bauer, and O. Hämmig (Berlin: Springer Science + Business Media), 43–68.

Schaufeli, W., De Witte, H., and Desart, S. (2019). *Manual burnout assessment tool (BAT)*. Leuven: Katholieke Universiteit Leuven.

Schaufeli, W., Desart, S., and De Witte, H. (2020). Burnout assessment Tool (BAT)—development, validity, and reliability. *Int. J. Environ. Res. Public Health* 17:9495. doi: 10.3390/ijerph17249495

Schonfeld, I. S. (1990). Coping with job-related stress: The case of teachers. *J. Occup. Psychol.* 63, 141–149. doi: 10.1111/j.2044-8325.1990.tb00516.x

Schonfeld, I. S. (2001). Stress in 1st-year women teachers: The context of social support and coping. *Genet. Soc. Gen. Psychol. Monogr.* 127, 133–168.

Seibert, S. E., Kraimer, M. L., and Liden, R. C. (2001). A social capital theory of career success. *Acad. Manag. J.* 44, 219–237. doi: 10.5465/3069452

Seth, A. (2016). Study of mental health and burnout in relation to teacher effectiveness among secondary school teachers. *Indian J. Health Wellbeing* 7, 769–773.

Siciliano, M. D. (2015). Advice networks in public organizations: The role of structure, internal competition, and individual attributes. *Public Adm. Rev.* 75, 548–559. doi: 10.1111/puar.12362

Snijders, T. A. (2002). Markov chain Monte Carlo estimation of exponential random graph models. *J. Soc. Struct.* 3, 1–40.

Snijders, T. A., Pattison, P. E., Robins, G. L., and Handcock, M. S. (2006). New specifications for exponential random graph models. *Sociol. Methodol.* 36, 99–153. doi: 10.1111/j.1467-9531.2006.00176.x

Sparrowe, R. T., Liden, R. C., Wayne, S. J., and Kraimer, M. L. (2001). Social networks and the performance of individuals and groups. *Acad. Manag. J.* 44, 316–325. doi: 10.5465/3069458

Spector, P. E., and Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: Interpersonal conflict at work scale, organizational constraints scale, quantitative workload inventory, and physical symptoms inventory. *J. Occup. Health Psychol.* 3, 356–367. doi: 10.1037/1076-8998.3.4.356

Spillane, J. P., and Kim, C. M. (2012). An exploratory analysis of formal school leaders' positioning in instructional advice and information networks in elementary schools. *Am. J. Educ.* 119, 73–102. doi: 10.1086/667755

Taris, T. W., Schreurs, P. J., and Van Iersel-Van Silfhout, I. J. (2001). Job stress, job strain, and psychological withdrawal among Dutch university staff: Towards a dualprocess model for the effects of occupational stress. *Work Stress* 15, 283–296. doi: 10.1080/02678370110084049

Van Droogenbroeck, F., Spruyt, B., and Vanroelen, C. (2014). Burnout among senior teachers: Investigating the role of workload and interpersonal relationships at work. *Teach. Teach. Educ.* 43, 99–109. doi: 10.1016/j.tate.2014.07.005

Van Zalk, N., Van Zalk, M. H. W., and Kerr, M. (2011). Socialization of social anxiety in adolescent crowds. *J. Abnorm. Child Psychol.* 39, 1239–1249. doi: 10.1007/s10802-011-9533-3

Vescio, V., Ross, D., and Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teach. Teach. Educ.* 24, 80–91. doi: 10.1016/j.tate.2007.01.004

Wang, P., Robins, G., Pattison, P., and Koskinen, J. (2014). *MPNet: Program for the simulation and estimation of (p*) exponential random graph models for multilevel networks.* Melbourne: Centre for Transformative Innovation, Swinburne University of Technology.

Wasserman, S., and Faust, K. (1994). *Social network analysis: Methods and applications*. Cambridge: Cambridge University Press.

Wasserman, S., and Pattison, P. (1996). Logit models and logistic regressions for social networks: I. An introduction to Markov graphs and p. *Psychometrika* 61, 401–425. doi: 10.1007/BF02294547

Weick, K. E., and Roberts, K. H. (1993). Collective mind in organizations: Heedful interrelating on flight decks. *Adm. Sci. Q.* 38, 357–381. doi: 10.2307/2393372

Zhang, Y., Zhang, Y., Ng, T. W., and Lam, S. S. (2019). Promotion-and prevention-focused coping: A meta-analytic examination of regulatory strategies in the work stress process. *J. Appl. Psychol.* 104, 1296–1323. doi: 10.1037/apl0000404

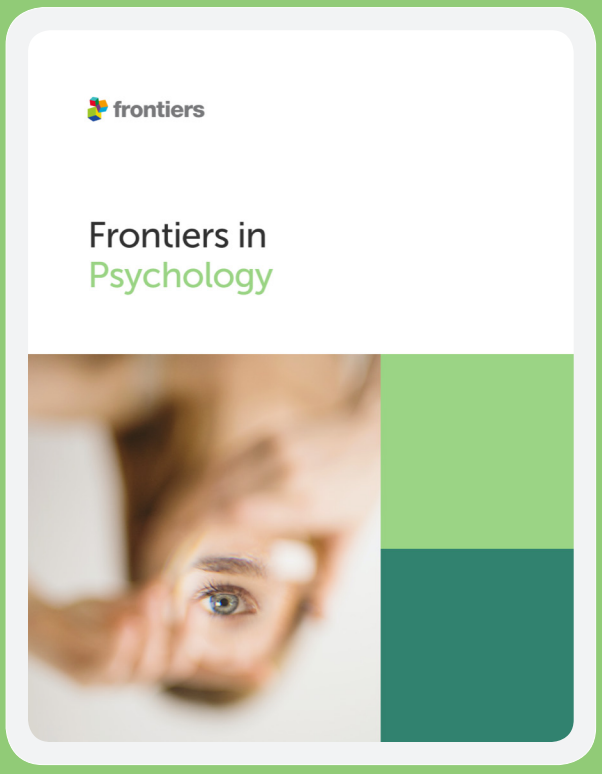
Frontiers in Psychology

Paving the way for a greater understanding of human behavior

The most cited journal in its field, exploring psychological sciences - from clinical research to cognitive science, from imaging studies to human factors, and from animal cognition to social psychology.

Discover the latest Research Topics

See more →



Frontiers

Avenue du Tribunal-Fédéral 34
1005 Lausanne, Switzerland
frontiersin.org

Contact us

+41 (0)21 510 17 00
frontiersin.org/about/contact