frontiers | Frontiers in Sustainability

TYPE Original Research
PUBLISHED 18 May 2023
DOI 10.3389/frsus.2023.1117892

OPEN ACCESS

EDITED BY
Rodrigo Lozano,
University of Gävle, Sweden

REVIEWED BY
Talat Islam,
University of the Punjab, Pakistan
Christoph Steinebach,
Zurich University of Applied Sciences, Switzerland

*CORRESPONDENCE
Simon L. Albrecht
✉ simon.albrecht@deakin.edu.au

RECEIVED 07 December 2022
ACCEPTED 28 April 2023
PUBLISHED 18 May 2023

CITATION
Albrecht SL, Donnelly T, Frenkiel M, Rajic SK, Kavadas V and Leiter MP (2023) Pro-environmental employee engagement: the influence of pro-environmental psychological capital, pro-environmental job resources, and perceived corporate environmental responsibility. *Front. Sustain.* 4:1117892. doi: 10.3389/frsus.2023.1117892

Pro-environmental employee engagement: the influence of pro-environmental psychological capital, pro-environmental job resources, and perceived corporate environmental responsibility

Simon L. Albrecht[1,2]*, Teagan Donnelly[2], Michael Frenkiel[2], Stefan K. Rajic[2], Vicki Kavadas[2] and Michael P. Leiter[2]

[1]School of Psychology, Deakin University, Geelong, VIC, Australia, [2]Faculty of Health, Deakin University, Burwood, VIC, Australia

For organizations to achieve their environmental obligations and objectives, they need employees to actively engage with environmental policies, practices, procedures, and initiatives. Based on engagement theory, a model is proposed that shows how perceived corporate environmental responsibility, pro-environmental job resources, and pro-environmental psychological capital influence employee pro-environmental engagement at work. Survey responses were collected from a Prolific sample of 347 full-time and part-time employees, aged 18–80, working within Australian organizations across a range of occupations. Confirmatory factor analysis and structural equations modeling provided broad support for the measures and the relationships proposed in the model. The model explained 64% of the variance in pro-environmental job resources, 90% of the variance in pro-environmental psychological capital, and 92% of the variance in pro-environmental engagement. Overall, the results suggest that for employees to feel enthusiastic and involved in pro-environmental initiatives at work, an integrated approach that takes account of perceived corporate environmental responsibility, pro-environmental job resources, and pro-environmental psychological capital is required. The results also provide brief, defensible measures of pro-environmental PsyCap, pro-environmental job resources and pro-environmental engagement that can be used to assess and target employee attitudes toward pro-environmental initiatives and opportunities. As such, the pro-environmental engagement model can help guide the design and implementation of evidence-based employee-focused interventions that will help achieve environmental sustainability objectives.

KEYWORDS

pro-environmental employee engagement, pro-environmental psychological capital (PsyCap), pro-environmental job resources, perceived corporate environmental responsibility, pro-environmental engagement model, pro-environmental supervisor support

Introduction

The climate crisis is not going away, and organizations are under increasing pressure to act in environmentally responsible ways (Albrecht et al., 2022a). In response, many organizations are embedding environmental sustainability at the heart of their corporate strategy, and enacting policies and practices that encourage or compel employees to act in environmentally responsible ways (Magill et al., 2020). However, many organizational responses take the form of piecemeal and disconnected initiatives (e.g., encouraging employee recycling and printing paper double-sides) that, by themselves, do not lead to optimal environmental outcomes (Termeer et al., 2017; Unsworth et al., 2021). Theoretically grounded, evidence-based, systematic, and integrated approaches are needed.

For organizations to achieve meaningful environmental sustainability objectives, they need employees to be positively and proactively engaged in environmental policies, practices, procedures, and initiatives (Benn et al., 2015; Islam et al., 2019; Albrecht et al., 2022a). Organizations therefore need to provide employees with the organizational, job and personal resources that will enable them to develop, maintain, and increase their pro-environmental engagement (Sweetman and Luthans, 2010; Magill et al., 2020; Albrecht et al., 2022a). In this paper, the construct of pro-environmental psychological capital is introduced as a personal resource. Pro-environmental psychological capital (P-E PsyCap) is introduced within an integrated theoretical framework aimed at helping organizations understand how perceived corporate environmental responsibility, pro-environmental job resources, and pro-environmental psychological capital inter-relate to drive and sustain employee pro-environmental engagement. Having first introduced the idea of pro-environmental engagement, we then draw from the literature to argue in support of the relationships modeled in Figure 1.

Pro-environmental engagement

Pro-environmental (P-E) engagement, as a construct, is an analog of work engagement. As such P-E engagement has been defined as "an enduring and positive work-related psychological state characterized by a genuine enthusiasm and willingness to support, adopt and promote work-related environmental sustainability" (Albrecht et al., 2022a; p. 2). Along similar lines, 'green engagement' has been defined in terms of the vigor, dedication, and absorption employees invest in pro-environmental activities, behaviors, and tasks (Aboramadan, 2022).

Drawing from conservation of resource theory (Hobfoll, 1989) and Job-Demands Resource theory (Bakker and Demerouti, 2017), researchers have shown that job, personal, and organizational resources positively influence work engagement (Albrecht et al., 2018; Vilariño del Castillo and Lopez-Zafra, 2021; Giancaspro et al., 2022). Extending such research, environmental-specific job, personal, and organizational resources have been shown to positively influence pro-environmental attitudes and behaviors. For example, perceived corporate environmental responsibility, green human resource management practices, pro-environmental supervisor support, pro-environmental information, and pro-environmental meaningful work have been shown to be associated with pro-environmental engagement and green innovative work behavior (Lasrado and Zakaria, 2020; Vilariño del Castillo and Lopez-Zafra, 2021; Aboramadan, 2022; Albrecht et al., 2022a). Furthermore, researchers have called for additional research to establish if personal resources such as hope, optimism, self-efficacy, and resilience, as elements of psychological capital (Luthans et al., 2007), are also associated with pro-environmental (P-E) engagement (Albrecht et al., 2022a). Overall, the present study aimed to extend previously established relationships (Albrecht et al., 2022a) by determining the relationships between perceived corporate environmental responsibility, pro-environmental (P-E) job resources, P-E psychological capital, and P-E engagement. The proposed model is shown in Figure 1 and elaborated below.

Perceived corporate environmental responsibility

Perceived corporate environmental responsibility (PCER) refers to employee perceptions about their organization's priorities, practices, policies, and initiatives aimed at protecting and preserving the natural environment (Tian et al., 2020; Albrecht et al., 2022a). PCER is an organizational resource that targets the environmental component of Corporate Social Responsibility (CSR). Although CSR has been found to be associated with pro-environmental behaviors, job performance, co-worker support, and engagement (Gond et al., 2017; Unsworth and McNeill, 2017; Afsar and Umrani, 2020; Ahmad et al., 2020), only a limited amount of empirical research has focused on the relationship between the environmental component of CSR and P-E engagement. In a recent study, Albrecht et al. (2022a) found that PCER had positive associations with pro-environmental job resources and pro-environmental engagement, and an indirect effect on perceived meaningfulness of work, through pro-environmental job resources. For present purposes, as shown in Figure 1 and as explained below, it is proposed that there will be direct positive associations between PCER and P-E job resources (H1), P-E psychological capital (H2), and P-E engagement (H3). Consistent with previous research (Albrecht et al., 2022a), although not explicitly modeled in Figure 1, it is also proposed that PCER will have positive indirect effects on P-E engagement through P-E job resources, and P-E psychological capital.

Pro-environmental job resources

Meta-analytic research has shown that supervisor support, co-worker support, involvement, and information are among the key job resources that influence engagement (Lesener et al., 2019; Mazetti et al., 2021). Pro-environmental analogs of these job resources have been shown to be associated with P-E engagement or related constructs (Yuriev et al., 2018; Afsar and Umrani, 2020; Albrecht et al., 2022a). P-E supervisor support refers to an

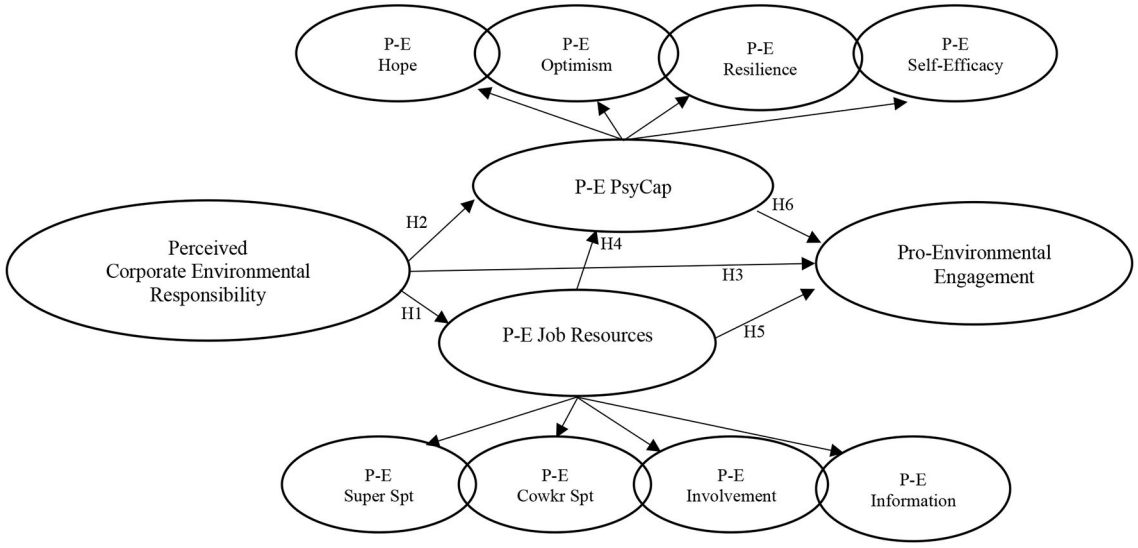

FIGURE 1
Proposed model. P-E, Pro-Environmental; PsyCap, Psychological Capital; Super Spt, Supervisor Support; Cowkr Spt, Co-worker Support.

employee's perception that their supervisor cares for, promotes, and provides support for environmentally sustainable practices at work (Albrecht et al., 2022a). P-E involvement refers to employees perceiving they have opportunities to be involved in P-E initiatives so that they feel personally connected to pro-environmental initiatives (Albrecht et al., 2022a). Similarly, P-E information refers to how well informed employees feel about P-E initiatives at work. Employees who are more informed, involved and supported in P-E initiatives are more likely to engage with them (Albrecht et al., 2022a).

The current study builds on existing literature by introducing pro-environmental co-worker support as an additional pro-environmental job resource. P-E co-worker support refers to the extent that employees perceive their co-workers support, encourage, and have positive beliefs about corporate environmental responsibility. Although only a limited amount of research has shown co-worker support to be positively associated with engagement (Simpson, 2009; Truong et al., 2021), numerous studies suggest that peer support and co-worker support influence positive psychological states, behavior, and performance (Chiaburu and Harrison, 2008; Chiaburu et al., 2013; Ng and Sorensen, 2018). On the basis of such previous research and theory, it is here proposed that pro-environmental co-worker support, as a pro-environmental job resource, will explain unique variance in pro-environmental engagement beyond the variance explained by previously researched pro-environmental job resources (see Figure 1). More broadly, it is proposed that P-E job resources, modeled as a higher order construct, will be positively associated with P-E psychological capital (H4) and P-E engagement (H5). Additionally, although not explicitly modeled in Figure 1, it is also proposed that P-E job resources will have a positive indirect effect on P-E engagement through P-E psychological capital (Paillé et al., 2013; Afsar and Umrani, 2020; Albrecht et al., 2022a).

Pro-environmental psychological capital

Psychological Capital (PsyCap) as a construct consists of four positive psychological resources—hope, optimism, resilience, and self-efficacy. Luthans et al. (2007), drawing from positive organizational behavior theory, applied strict inclusion criteria to conceptualize and define PsyCap as a higher order construct that explains the relationships among each of its four intercorrelated components. Luthans et al. (2007) proposed that PsyCap and its constituent elements are state-like vs. trait-like, and that they are therefore malleable and able to be developed. Meta-analyses and reviews have shown that PsyCap is positively associated with numerous attitudes, behaviors, and positive performance outcomes (Avey et al., 2011; Newman et al., 2014; Donaldson et al., 2020; Shah et al., 2023). Furthermore, PsyCap, as a synergistic higher-order construct, has been shown to explain more variance in outcome measures than the sum of its four constituent parts (Luthans et al., 2007).

Acknowledging that throughout the research literature there are numerous competing definitions and measures of each of the four PsyCap constructs, Luthans et al.'s (2007) definitions and measures have been widely researched and widely validated (Newman et al., 2014). With respect to the individual components of PsyCap, hope is a motivational state reflected in a positive anticipation about achieving desired goals (Luthans et al., 2007; Vilariño del Castillo and Lopez-Zafra, 2021). Optimism is reflected in a positive view about current and future success. Self-efficacy is reflected in an individual's confidence to use their resources to successfully achieve challenging tasks within a given context. Resilience reflects a capacity to successfully bounce back from adversity, conflict, and challenge (Vilariño del Castillo and Lopez-Zafra, 2021).

Beyond its status as a generic personal resource, researchers have suggested that PsyCap, and its constituent elements, can be

adapted to apply in domain-specific contexts. Jimmieson et al. (2004), for example, showed that domain-specific change-related self-efficacy had a direct and positive influence on employee attitudes to change. Similarly, Albrecht et al. (2020) suggested that change-related PsyCap, change-related hope, change-related optimism, change-related resilience, and change-related self-efficacy will predict positive employee attitudes to change.

For present purposes, pro-environmental (P-E) PsyCap was adapted from the original conceptualization (Luthans et al., 2007) to a domain-specific pro-environmental context. In contrast to the original conceptualization, previous research on pro-environmental PsyCap conceptualized it as a unidimensional, first order construct, measured with four-items (Nisar et al., 2022). Furthermore, such previous research has not examined P-E PsyCap within a coherent theoretical framework that takes into account the influence of pro-environmental organizational, job and personal resources on P-E pro-environmental engagement. For present purposes, because hope, optimism, resilience, and self-efficacy all require individuals to view their environment positively, and to anticipate and successfully adapt to change (Albrecht et al., 2020), as per Figure 1, it is proposed that pro-environmental PsyCap, modeled as a higher order construct, will be positively associated with pro-environmental engagement (Ho 6).

Aims

The research makes a number of contributions to the engagement and pro-environmental sustainability literatures. As previously noted, a model is tested that proposes how pro-environmental organizational, job and personal resources influence employee pro-environmental engagement (see Figure 1). More specifically, pro-environmental psychological capital (P-E PsyCap) is introduced as a construct that is proposed, in part, to explain the influence of P-E organizational and P-E job resources on pro-environmental engagement. Pro-environmental co-worker support is introduced as a previously unexamined P-E job resource. Overall, by considering the relationships between P-E organizational, P-E job resources and P-E psychological capital, the research potentially provides organizations with a theory-based and integrated framework to advance their environmental sustainability outcomes through increased employee pro-environmental engagement.

Methods

Participants and Procedure: Participants sourced via Prolific were invited in 2022 to participate in an online survey focused on their pro-environmental experiences at work. Prolific is an online platform that provides researchers with access to paid participants that meet specific inclusion criteria. Participants were required to be aged 18 years or over, to work a minimum of 15 h per week, and to have worked for at least 3 months within an Australian organization of 15 or more employees. Recent research has shown that data derived from Prolific has similar psychometric properties to meta-analytic results derived from more conventionally sourced survey data (Walter et al., 2019; Albrecht et al., 2020). The invitation to participate included a Plain Language Statement approved by the researchers' University Ethics Committee.

Broadly consistent with the profile of previous Prolific samples (e.g., Albrecht et al., 2022b), of the 347 participants, 171 (49.3%) were female, and 171 (49.3%) were male. Age ranged from 18 to 80 years (M = 34.32), organization size ranged from 15 to 300,000 employees, and employee job tenure ranged from 6 months to 60 years. Respondents reported their occupation as manager (9.2%), professional (34%), technical and trades worker (4.3%), community and personal service worker (7.5%), clerical and administrative worker (17%), sales worker (11.2%), machinery operator or driver (**0.9**%), laborer (5.2%) or other (10.7%). Participants identified as team members (64.6%), team leaders (14.1%), managers (8.1%) or other (7.8%), and reported working full-time (57.1%), part-time (29.4%) or casual at more than 15 h per week (11.8%). A power analysis showed that the sample size used in the analyses ($N = 347$) exceeded the minimum sample size ($N = 200$) needed to test the proposed model (Soper, 2022).

Measures

Given that a minimum of three items are sufficient to define a construct (Jöreskog and Sörbom, 1993), 30 items were used to measure 10 constructs reflecting organizational, job, and personal pro-environmental resources, as well as pro-environmental employee engagement. The items were drawn or adapted from previously validated scales to reflect a focus on environmental sustainability. All items were anchored on a seven-point Likert scale (1 = strongly disagree to 7 = strongly agree).

Perceived corporate environment responsibility

Perceived corporate environment responsibility (PCER), was measured using the three items from Albrecht et al. (2022a) adaptation of Glavas and Kelley (2014) perceived corporate social and environmental responsibility scale. The items included 'This organization takes great care that our work does not hurt the environment'. Albrecht et al. (2022a) reported a Cronbach's alpha of $\alpha = 0.90$ for the same set of items.

Pro-environmental job resources

Pro-environmental involvement, information and supervisor support were measured using three item scales from Albrecht et al. (2022a). Items included "I get enough opportunities to be involved in initiatives aimed at improving our environmental impact"; "I am clearly informed about the reasons underlying proposed environmental sustainability initiatives", and "the person I report to actively encourages me to come up with ways to work in a more environmentally sustainable way". Albrecht et al. reported Cronbach's alphas of $\alpha = 0.92$, $\alpha = 0.92$ and $\alpha = 0.89$ for the three scales. Pro-environmental co-worker support was measured using a scale adapted from Paillé et al. (2013) and Albrecht et al. (2022a),

who reported Cronbach's alphas of $\alpha = 0.90$ and 0.92, respectively, for similarly constructed scales.

Pro-environmental psychological capital

The four constructs hope, optimism, resilience, and self-efficacy were each measured using three items adapted from Luthans et al. (2007) psychological capital questionnaire and Lorenz et al. (2016) Compound PsyCap Scale. Items were adapted to fit the context of environmental sustainability. Items for pro-environmental hope included "There are lots of ways around any environmental sustainability problems that I am now facing". Items for pro-environmental optimism included, "I think things will work out well regarding environmental sustainability in this organization". Items for pro-environmental resilience included, "Dealing with difficult environmental sustainability issues at work enables me to learn and develop". Items for pro-environmental self-efficacy included, "I am confident of my ability to implement any environmental initiatives that the organization promotes".

Pro-environmental engagement

Pro-environmental engagement was measured with three items from Albrecht et al. (2022a). Items included "I am enthusiastic about environmental sustainability initiatives in this organization". Albrecht et al. (2022a) reported a Cronbach's alpha of $\alpha = 0.82$ for the same scale.

Data analytic strategy

A two-stage approach was applied to the analyses (Anderson and Gerbing, 1988). First, confirmatory factor analysis (CFA) was conducted to assess the goodness of fit of the measurement model. The fit for proposed and alternative models was determined with reference to recommended criteria (Hu and Bentler, 1999; Kline, 2016): ratio of chi-square to degrees of freedom (χ^2 /df $\leq$ 2); Tucker–Lewis's index (TLI) $\geq$ 0.95; comparative fit index (CFI) $\geq$ 0.95; standardized root-mean-square residual (SRMR) $\leq$ **0.0**8; and root-mean-square error of approximation (RMSEA) $\leq$ **0.0**5 with 95% confidence intervals. Less stringent criteria have also been proposed: χ^2 /df $\leq$ 3, TLI $\geq$ 0.90, RMSEA $\leq$ **0.0**8 (McNeish and Wolf, 2021). Modification indices were examined to determine if fit could be improved by deleting items that most contributed to model misspecification. The CFA analytic strategy also included assessing the influence of common method bias (Podsakoff et al., 2012) and assessing the defensibility of the proposed higher order modeling (see below).

The second step in the two-step approach involved using structural equations modeling (SEM) to test the fit of the proposed model, as shown in Figure 1. Fit was assessed using the same indices as per the CFA. As a final step in the data analysis process a relative weights analysis (RWA; Tonidandel and LeBreton, 2014) was conducted to specify the percentage contribution of the first-order predictor variables in explaining the variance in pro-environmental engagement.

Results

Measurement model

The proposed measurement model, with each construct modeled as a first-order construct, yielded generally acceptable fit (see Table 1). CFI and SRMR values met the more stringent cut off criteria, whereas the RMSEA and TLI values met the less stringent criteria for acceptable fit (McNeish and Wolf, 2021). Table 1 also shows that the fit for the proposed model was clearly superior to a one-factor, two-factor and three-factor model calculated for comparison purposes. Also in support of the model, and as shown in Table 2, the standardized factor loadings ranged from **0.6**7 to **0.9**7, and therefore exceeded the recommended criterion of **0.5**0 for retention in measurement models (Podsakoff et al., 2012; Kline, 2016).

Consistent with existing literature (Albrecht et al., 2022a), pro-environmental (P-E) job resources, and P-E PsyCap were modeled as higher order (HO) constructs (see Figure 1). As such, P-E job resources, as a HO construct, is proposed to explain the covariation between P-E information, P-E involvement, P-E coworker support, and P-E supervisor support (Albrecht et al., 2022a). Similarly, P-E PsyCap as a higher order construct is proposed to explain the covariation between P-E hope, P-E optimism, P-E resilience, and P-E self-efficacy (Lorenz et al., 2016). In support of the validity of both HO models, the Target Coefficient (TC2) values of **0.9**7 and **0.9**4 met the recommended criteria of being close to one (Marsh and Hocevar, 1985; Marsh, 1987).

As a further test of the measurement model, given the cross-sectional and self-report nature of the data, a test of common method variance (CMV) was conducted. Using a procedure recommended by Podsakoff et al. (2012), a latent common method factor was added to the proposed measurement model. The common method factor decreased the standardized loadings for twenty of the thirty items by a value >0.20. Not surprisingly, fifteen of the 20 items were part of a higher order factor. The remaining five items were from the PCER and P-E Engagement scales. Overall, given that the average decrease across the full set of items was relatively minor (average = 0.29) and given that all factor loadings remained statistically significant ($p \leq 0.001$) after the inclusion of the common method factor, the influence of method effects appears not to be overly problematic (Johnson et al., 2011; Podsakoff et al., 2012).

The means, standard deviations, Cronbach's alpha, and correlations for the measurement model are shown in Table 3. Despite the use of brief 3-item scales, all Cronbach's alphas exceeded the recommended criteria of 0.80, thereby clearly suggesting internal consistency (Nunnally and Bernstein, 1994). The relatively modest bivariate correlations ($r \leq 0.78$) and the low variance inflation factors scores ($\leq$3.65) indicate that multi-collinearity would not pose undue statistical concerns in the structural equation model (Thompson et al., 2017).

TABLE 1 Fit indices for proposed and comparison measurement models, and structural model ($N = 347$).

Variable	χ^2	*df*	χ^2/df	TLI	CFI	RMSEA (95% CI)	SRMR
Measurement model							
One factor model	3,433.41	405	8.48	0.64	0.67	0.15 (0.14, 0.15)	0.09
Two factor model	3,370.69	404	8.34	0.65	0.67	0.15 (0.14, 0.15)	0.09
Three factor model	3,112.48	402	7.74	0.68	0.70	0.14 (0.14, 0.14)	0.08
Proposed first order model	793.97	360	2.21	0.94	0.95	0.06 (0.05, 0.07)	0.05
Structural model							
Proposed	993.27	391	2.54	0.93	0.93	0.07 (0.06, 0.07)	0.07

Structural model

As shown in Table 1, the proposed structural model yielded acceptable fit. As shown in Figure 2, except for two paths, all proposed direct effects were statistically significant. In support of H1 and H2, perceived corporate environmental responsibility (PCER) had a positive and significant direct effect on P-E job resources ($\beta = 0.80$, $p = <0.001$) and on P-E PsyCap ($\beta = 0.28$, $p = <0.01$). In support of H4, P-E job resources had a positive and significant direct effect on P-E PsyCap ($\beta = 0.71$, $p = <0.001$). In support of H6, P-E PsyCap had a positive and significant direct effect on P-E engagement ($\beta = 1.44$, $p = <0.001$). The paths from P-E job resources to P-E engagement (H5) and from PCER to P-E engagement (H3) were not significant.

Beyond the direct effects, bias corrected bootstrapping procedures showed that PCER had a significant positive indirect effect on P-E engagement through P-E PsyCap ($\beta = \mathbf{0.3}4$, $p \leq 0.01$) and through both P-E job resources and P-E PsyCap ($\beta = \mathbf{0.7}1$, $p = <0.001$). However, PCER had a non-significant positive indirect effect on P-E engagement through P-E job resources ($p = 0.08$). P-E job resources had a significant indirect effect on P-E engagement through P-E PsyCap ($\beta = 1.38$, $p \leq 0.01$). In support of overall validity, the model explained 64% of the variance in P-E job resources, a substantial 90% of the variance in P-E PsyCap, and 92% of the variance in P-E engagement. Modification indices did not indicate any theoretically justified adjustments that would result in an improved model fit. Therefore, the proposed structural model was accepted.

Relative weights analysis

As a final step in the analyses, *post hoc* relative weight analyses (RWA) were conducted to determine the relative importance of the first order constructs as predictors of pro-environmental engagement (Tonidandel and LeBreton, 2014). The RWA results showed that the full set of predictor variables explained 67% of the variance in pro-environmental engagement. PCER explained 11.9%, P-E co-worker support explained 10.8%, P-E supervisor support explained 9.8%, P-E involvement explained 5.6 %, P-E information explained 7.5%, P-E hope explained 11.1 %, P-E resilience explained 20.8%, P-E optimism explained 15.8%, and P-E self-efficacy explained 6.7%. Given that none of the relative weight confidence intervals included zero, all predictor relative weights were significant. Additionally, examining the percent contribution of the first order PsyCap factors on P-E engagement, P-E optimism explained 37.9%, P-E resilience explained 32.8%, P-E hope explained 17.5%, and P-E self-efficacy explained 11.7% of the total 65% of variance explained.

Discussion

The study contributes to the literature by validating pro-environmental engagement as a potentially important construct to help organizations successfully achieve environmental sustainability initiatives. The study further contributes to the literature by evaluating the impact of perceived corporate environmental responsibility, pro-environmental job resources, and pro-environmental psychological capital on pro-environmental engagement. Additionally, the study contributes to the literature by validating pro-environmental psychological capital (P-E PsyCap) as a new domain-specific measure relevant to pro-environmental engagement. The study also introduces a measure of pro-environmental co-worker support as a potentially important domain-specific pro-environmental job resource.

Consistent with pro-environmental engagement literature, and in support of the potential utility of the model, the final structural equation model demonstrated fit and explained a large proportion of variance in pro-environmental engagement (92%). As hypothesized, perceived corporate environmental responsibility was positively associated with pro-environmental job resources (H1) and with pro-environmental psychological capital (H2). Additionally, and consistent with JD-R theory, pro-environmental job resources had a strong, direct effect on pro-environmental psychological capital (H4).

Contrary to expectations, perceived corporate environmental responsibility (PCER) did not have a direct effect on pro-environmental employee engagement (H3). The non-significant direct effect may in part be attributable to the influence of PCER being absorbed by the strong indirect effects through pro-environmental job resources and pro-environmental psychological capital. The non-significant direct effect can also be explained by the proximal and distal nature of the relationships (Lee and Lunn, 2019; Albrecht et al., 2022a). Proximal factors refer to internal

TABLE 2 Scale items and standardized loadings included in CFA measurement model ($N = 347$).

Scale	Item	Loading
Perceived corporate environmental responsibility (PCER)		
PCER 1	Environmental issues are integral to the strategy of the organization.	0.82
PCER 2	This organization takes great care that our work does not hurt the environment.	0.91
PCER 3	The organization achieves its short-term goals while staying focused on its impact on the environment.	0.94
Pro-environmental job resources (P-E JRes)		
Pro-environmental involvement		
P-E Inv 1	I get enough opportunities to be involved in initiatives aimed at improving our environmental impact.	0.70
P-E Inv 2	I have opportunities to suggest ways to improve our environmental sustainability and environmental impact.	0.96
P-E Inv 3	I have opportunities to offer ideas about how to improve our environmental performance.	0.97
Pro-environmental information		
P-E Info 1	I am clearly informed about the reasons underlying proposed environmental sustainability initiatives.	0.85
P-E Info 2	I am informed about our organization's environmental objectives.	0.88
P-E Info 3	Information I receive adequately answers any questions I may have regarding the impact our organization has on the environment.	0.83
Pro-environmental supervisor support		
P-E SS 1	The person I report to is supportive of environmental sustainability.	0.75
P-E SS 2	The person I report to is helpful to me in learning about how to work in a more environmentally sustainable way.	0.96
P-E SS 3	The person I report to actively encourages me to come up with ways to work in a more environmentally sustainable way.	0.93
Co-worker support		
P-E CoSup 1	My co-workers are helpful to me in learning about how to work in a more environmentally sustainable way.	0.92
P-E CoSup 2	My co-workers actively encourage me to come up with ways to work in a more environmentally sustainable way.	0.90
P-E CoSup 3	My co-workers believe it is important that our work is as environmentally sustainable as possible.	0.74
Pro-environmental psychological capital (P-E PsyCap)		
Pro-environmental hope		
P-EHope 1	There are lots of ways around any environmental sustainability problems that I am now facing.	0.74
P-E Hope 2	Right now, I see myself as being pretty successful at environmental sustainability.	0.79
P-E Hope 3	I can think of many ways to reach my goals for environmental sustainability.	0.76
Pro-environmental optimism		
P-E Opt 1	I usually feel positive when thinking about environmental sustainability and this organization.	0.91
P-E Opt 2	I think things will work out well regarding environmental sustainability in this organization.	0.94
P-E Opt 3	I am optimistic about environmental sustainability in this organization.	0.92
Pro-environmental resilience		
P-E Res 1	Dealing with difficult environmental sustainability issues at work enables me to learn and develop.	0.80
P-E Res 2	I find ways to handle any difficulties associated with environmental sustainability at work	0.83
P-E Res 3	I bounce back when I confront environmental setbacks at work.	0.71
Pro-environmental self-efficacy		
P-E SEff 1	I am confident of my ability to implement any environmental initiatives that the organization promotes.	0.81
P-E SEff 2	I feel confident I can work through problems at work to find solutions regarding environmental sustainability.	0.93
P-E SEff 3	I feel confident contributing to discussions about environmental sustainability.	0.73
Pro-environmental engagement (P-E Eng)		
P-E Eng 1	I am enthusiastic about environmental sustainability initiatives in this organization.	0.76
P-E Eng 2	I feel positive about the environmental sustainability implications of my job.	0.87
P-E Eng 3	I strive as hard as I can to contribute positively to environmental sustainability initiatives in this organization.	0.67

TABLE 3 Means, standard deviations, correlations, and Cronbach's alpha of first order variables ($N = 347$).

Variable	*M*	SD	1	2	3	4	5	6	7	8	9	10
1. PCorpEnvResp	4.07	1.62	**0.92**									
2. P-E Super Spt	4.07	1.55	0.63	**0.91**								
3. P-E Cowkr Spt	4.17	1.46	0.52	0.68	**0.89**							
4. P-E Involvement	3.68	1.61	0.60	0.67	0.60	**0.90**						
5. P-E Information	3.92	1.58	0.69	0.63	0.55	0.68	**0.89**					
6. P-E Hope	4.48	1.16	0.45	0.51	0.43	0.43	0.45	**0.81**				
7. P-E Resilience	4.63	1.16	0.52	0.59	0.53	0.49	0.50	0.60	**0.82**			
8. P-E Optimism	4.32	1.61	0.78	0.66	0.60	0.67	0.72	0.49	0.61	**0.95**		
9. P-E Self-Efficacy	4.78	1.30	0.40	0.45	0.45	0.42	0.44	0.53	0.56	0.48	**0.86**	
10. P-E Engagement	4.48	1.39	0.66	0.62	0.59	0.56	0.60	0.56	0.69	0.75	0.47	**0.82**

Cronbach's alpha reliabilities are shown in bold on the diagonal.
All correlations are significant at $p < 0.01$.
P-E, Pro-Environmental; PCorpEnvResp, Perceived Corporate Environment Responsibility; Super Spt, Supervisor Support; Cowkr Spt, Co-worker Support.

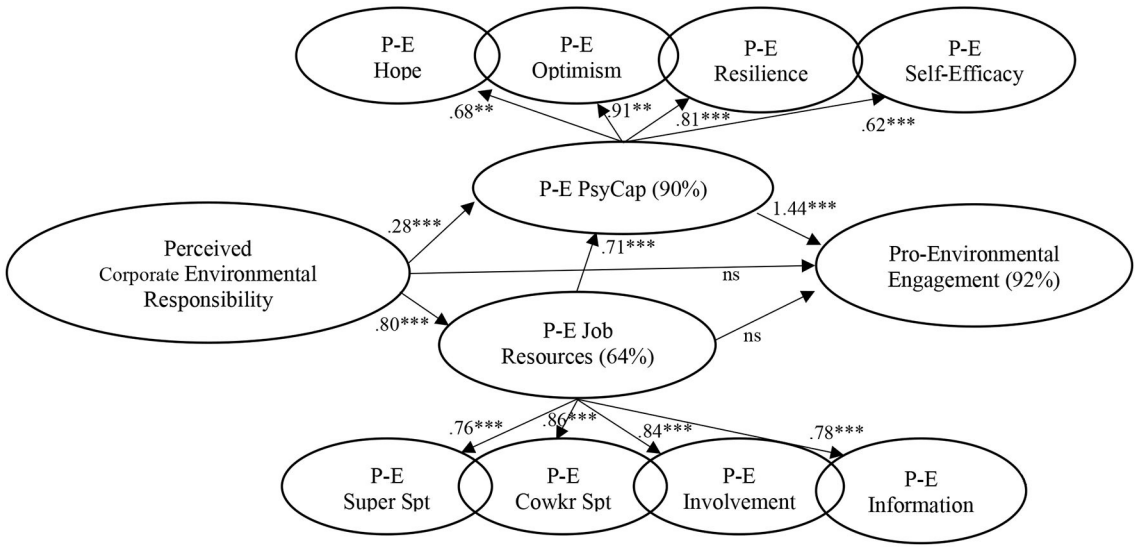

FIGURE 2
Structural model with standardized maximum likelihood parameter estimates ($N = 347$). $^{**}p < 0.01$, $^{***}p < 0.001$, ns, non-significant; P-E, Pro-Environmental; PsyCap, Psychological Capital; Super Spt, Supervisor Support; Cowkr Spt, Co-worker Support. Items and errors not shown for ease of representation. Percent variance explained in parentheses.

psychological states that are immediately felt as part of an employee experience. Distal factors refer to organizational and job factors that influence employee psychological states and are more distant and external to the employee experience. As such, distal factors are more likely to have weaker direct effects, and/or moderately strong indirect effects, on outcomes (Albrecht et al., 2022a). Nevertheless, the significant indirect effect of perceived corporate environmental responsibility on pro-environmental engagement through the more proximal resources of pro-environmental job resources and psychological capital aligns with systems theory (Maes and Van Hootegem, 2019). Systems theory suggests that organizational, job, and personal resources all need to be considered as integrated inputs that help understand the emergence and maintenance of work-related psychological, behavioral, and performance outcomes (Norton et al., 2014, 2015; Albrecht et al., 2020; Magill et al., 2020).

Proximal-distal arguments, albeit to a lesser extent, can also explain the non-significant relationship between pro-environmental job resources and pro-environmental engagement (H5), and the non-significant indirect effect from perceived corporate environmental responsibility to pro-environmental engagement. The strong proximal relationship between pro-environmental psychological capital and pro-environmental engagement (H6) may have, in part, diluted the influence of more distal variables. The finding that personal resources have a greater direct influence on pro-environmental engagement is consistent with recent research showing the strong influence

of pro-environmental meaningful work on pro-environmental engagement (Lee and Lunn, 2019; Albrecht et al., 2022a).

In alignment with the PsyCap literature (Luthans et al., 2007), pro-environmental psychological capital was conceptualized and modeled as a higher-order construct consisting of pro-environmental hope, optimism, resilience, and self-efficacy. The measurement properties of the newly developed pro-environmental PsyCap scales were supported by confirmatory factor analysis. Furthermore, and in support of the validity of the construct, RWA analysis showed that all four pro-environmental first order PsyCap factors explained significant variance in P-E engagement. Optimism and resilience had the strongest direct effects on pro-environmental engagement. The research therefore extends psychological capital theory and literature (Vilariño del Castillo and Lopez-Zafra, 2021) by expanding the domains in which it can be applied, and by validating a brief and reliable twelve-item scale.

As previously noted, pro-environmental job resources was modeled as a higher-order construct consisting of pro-environmental information, involvement, supervisor, and co-worker support. No previous pro-environmental research has included co-worker support as a pro-environmental job resource within an integrated framework. RWA analysis showed that of the pro-environmental job resources, pro-environmental co-worker support and pro-environmental supervisor support had the strongest direct effects on pro-environmental engagement.

Overall, the results suggest that for organizations to unlock the full potential of pro-environmental engagement, an integrated approach is needed. In line with systems theory (Maes and Van Hootegem, 2019), the results suggest that although a corporate environmental strategy can serve as an important input to pro-environmental engagement, it needs to be enacted through the provision of pro-environmental job resources and the enabling of psychological capital. This study therefore extends the findings from recent research (Norton et al., 2015; Magill et al., 2020; Albrecht et al., 2022a) that suggests the need for organizations to action environmental sustainability within an integrated framework using a systems approach. It has previously been argued that research within the domain has lacked an encompassing theoretical base (Simpson, 2009; Magill et al., 2020).

Conclusions

Briefly reiterating and elaborating on the contributions and practical implications outlined above, the research makes a number of contributions to the literature and to organizational practice. Firstly, the first-order measures of pro-environmental job resources and psychological capital demonstrated acceptable psychometric properties. The measures can therefore be usefully included in surveys aimed at assessing employee experiences of, and preparedness to engage in, pro-environmental initiatives. Secondly, the breadth of pro-environmental job resources examined was extended to include pro-environmental co-worker support (Afsar and Umrani, 2020). The RWA results suggested that both co-worker support and supervisor support explained significant variance in pro-environmental engagement and therefore could provide a focus for interventions aimed at developing pro-environmental engagement. Such interventions could include facilitated team developmental opportunities whereby coworkers collectively identify how to better identify, action, and monitor the environmental impact of their work (Jungert et al., 2018). Thirdly, the research provided evidence in support of pro-environmental psychological capital as a construct and as an antecedent of pro-environmental engagement. It follows that pro-environmental interventions to develop pro-environmental engagement could potentially draw from well-validated micro interventions recommended for developing psychological capital. Luthans and Avolio (2006), for example, argued that their 1-h micro intervention for developing psychological capital provided an effective and efficient means for organizations to help secure competitive advantage. Such interventions, adapted to focus on pro-environmental PsyCap, could not only enable organizations to achieve their environmental sustainability objectives, but could also support their overall effectiveness and bottom-line performance (Luthans and Avolio, 2006). Given that optimism and resilience had the strongest direct effects on pro-environmental engagement, interventions focused on developing pro-environmental optimism and pro-environmental resilience will likely provide utility when aiming to develop employee pro-environmental psychological capital and therefore pro-environmental engagement. Fourthly, the study provided a holistic and integrated framework for organizations to use to assess and increase pro-environmental engagement through an interplay of organizational, job, and personal resources (Yuriev et al., 2018; Magill et al., 2020). The study suggests that employees are more likely to engage in pro-environmental organizational initiatives, and to perceive the organizational corporate environmental responsibility initiatives in a positive light, if they have appropriate job and personal level supports in place. The more information and opportunities to be involved in pro-environmental initiatives, as well as being supported by supervisors and peers that are advocates of, and role models for, pro-environmental, would lead to higher pro-environmental engagement.

Limitations and future research

Despite the use of a reasonably rigorous data analysis process there are several limitations to be acknowledged. Firstly, given the self-report nature of the data and the cross-sectional design, tests showed some degree of common method bias in the data set. To mitigate the potential effects of common method bias, future research could usefully test the proposed relationships using longitudinal research designs to examine how the relationships play out across various points in time (Podsakoff et al., 2012). Longitudinal designs not only reduce the threat of common method bias, but also improve the confidence that causal inferences among the proposed relationships can be drawn (Xanthopoulou et al., 2013). Secondly, the current study used data drawn from an array of organizations, therefore perhaps limiting the extent to which the findings can be generalized to particular working contexts. Future studies might usefully consider gathering data from discrete organizations across a range industries and cultural contexts. Such research will enable the design of interventions

that take account of the particular configuration of organizational, job and personal pro-environmental resources accessible to employees focused on achieving organizational environmental sustainability objectives.

With respect to future research on pro-environmental attitudes and behavior, the influence of additional organizational factors could be included within the proposed framework. Such factors include organizational resources such as pro-environmental organizational climate, green human resource management processes, and pro-environmental senior leadership (Norton et al., 2014; Aguinis and Glavas, 2019; Hicklenton et al., 2019; Amrutha and Geetha, 2020). In addition, there are further pro-environmental personal resources such as meaningful work (Albrecht et al., 2022a), empathy (Islam et al., 2019), and psychological safety (Ahmad and Umrani, 2019; Jin et al., 2022) that may potentially increase the explanation of pro-environmental engagement. Moreover, future research would be useful to help understand the influence of pro-environmental engagement on downstream outcomes such as pro-environmental behavior, wellbeing, and job satisfaction (Norton et al., 2015; Bohlmann et al., 2018; Zhang et al., 2021). Such research would help organizations quantify the return they may get for investing in interventions that target pro-environmental organizational, job and personal resources. Lastly, and as previously noted, a range of quasi-experimental studies or interventions could be conducted to test alternative methods of helping organizations to successfully increase job and personal resources to drive higher pro-environmental engagement.

In conclusion, the study contributes to organizational sustainability, psychological capital, and engagement literature by providing an integrated framework for understanding how to assess and drive pro-environmental engagement at work. Although the cross-sectional research design precludes any conclusion with respect to causal relations, the test of the pro-environmental engagement model showed that pro-environmental engagement is potentially influenced by pro-environmental organizational, job, and personal resources. Extending on previous research that has looked at a systemic and integrated interplay of resources to help organizations achieve environmental sustainability, this is the first study to introduce a multi-dimensional and domain-specific measure of pro-environmental psychological capital as an antecedent to pro-environmental engagement. Overall, the results suggest that organizations that approach environmental sustainability from a systems perspective are more likely to have employees that are pro-environmentally engaged. Organizations may therefore be able to accelerate the pace at which they achieve their environmental sustainability objectives by implementing a set of interventions that target the factors included within the model. Finally, if more organizations were able to transform the way they achieved environmental sustainability through a focus on building the resources outlined in the model, there could be substantial positive flow-on impacts to the broader society and communities across the globe. By building pro-environmental organization, job, and personal resources, organizations have an opportunity to help reshape the future for generations to come.

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 Deakin University Ethics Committee HEAG-H. The Project (HEAG-H 60_2021) has been given approval as it meets the requirements of the National Statement on Ethical Conduct in Human Research 2007 (Updated 2018). The patients/participants provided their written informed consent to participate in this study.

Author contributions

SA initiated the conceptualization of the project, collected the data, conducted the analyses, and was responsible for the structure and content of the final manuscript. TD, MF, SR, and VK participated in the idea development, data collection, data analyses, and contributed to the structure and content of the final manuscript. ML reviewed the structure and content of the final manuscript and provided support for the publication process. All authors approved the final submitted 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

Aboramadan, M. (2022). The effect of green HRM on employee green behaviors in higher education: the mediating mechanism of green work engagement. *Int. J. Organ. Anal.* 30, 7–23. doi: 10.1108/IJOA-05-2020-2190

Afsar, B., and Umrani, W. A. (2020). Corporate social responsibility and pro-environmental behavior at workplace: the role of moral reflectiveness, co-worker advocacy, and environmental commitment. *Corp. Soc. Responsib. Environ. Manag.* 27, 109–125. doi: 10.1002/csr.1777

Aguinis, H., and Glavas, A. (2019). On corporate social responsibility, sensemaking, and the search for meaningfulness through work. *J. Manage.* 45, 1057–1086. doi: 10.1177/0149206317691575

Ahmad, I., and Umrani, W. A. (2019). The impact of ethical leadership style on job satisfaction: mediating role of perception of Green HRM and psychological safety. *Lead. Organ. Dev. J.* 40, 534–547. doi: 10.1108/LODJ-12-2018-0461

Ahmad, R., Ahmad, S., Islam, T., and Kaleem, A. (2020). The nexus of corporate social responsibility (CSR), affective commitment and organisational citizenship behaviour in academia: a model of trust. *Emp. Relations*, 42, 232–247. doi: 10.1108/ER-04-2018-0105

Albrecht, S., Breidahl, E., and Marty, A. (2018). Organizational resources, organizational engagement climate, and employee engagement. *Career Develop. Int.* 23, 67–85. doi: 10.1108/CDI-04-2017-0064

Albrecht, S. L., Bocks, A., Dalton, J., Lorigan, A., and Smith, A. (2022a). Pro-environmental employee engagement: the influence of pro-environmental organizational, job and personal resources. *Sustainability*, 14, 43. doi: 10.3390/su14010043

Albrecht, S. L., Connaughton, S., Foster, K., Furlong, S., and Yeow, C. J. L. (2020). Change engagement, change resources, and change demands: a model for positive employee orientations to organizational change. *Front. Psychol.* 11, 531944. doi: 10.3389/fpsyg.2020.531944

Albrecht, S. L., Connaughton, S., and Leiter, M. P. (2022b). The influence of change-related organizational and job resources on employee change engagement. *Front. Psychol.* 13, 910206. doi: 10.3389/fpsyg.2022.910206

Amrutha, V. N., and Geetha, S. N. (2020). A systematic review on green human resource management: implications for social sustainability. *J. Clean. Prod.* 247, 119131. doi: 10.1016/j.jclepro.2019.119131

Anderson, J. C., and Gerbing, D. W. (1988). Structural equation modelling in practice: a review and recommended two-step approach. *Psychol. Bull.* 103, 411–423. doi: 10.1037/0033-2909.103.3.411

Avey, J. B., Reichard, R. J., Luthans, F., and Mhatre, K. H. (2011). Meta-analysis of the impact of positive psychological capital on employee attitudes, behaviors, and performance. *Hum. Resour. Dev. Q.* 22, 127–152. doi: 10.1002/hrdq.20070

Bakker, A. B., and Demerouti, E. (2017). Job demands-resources theory: taking stock and looking forward. *J. Occup. Health Psychol.* 22, 273–285. doi: 10.1037/ocp0000056

Benn, S., Teo, S. T. T., and Martin, A. (2015). Employee participation and engagement in working for the environment. *Pers. Rev.* 44, 492–510. doi: 10.1108/PR-10-2013-0179

Bohlmann, C., van den Bosch, J., and Zacher, H. (2018). The relative importance of employee green behavior for overall job performance ratings: a policy-capturing study. *Corp. Soc. Responsib. Environ. Manag.* 25, 1002–1008. doi: 10.1002/csr.1516

Chiaburu, D. S., and Harrison, D. A. (2008). Do peers make the place? Conceptual synthesis and meta-analysis of coworker effects on perceptions, attitudes, OCBs, and performance. *J. Appl. Psychol.* 93, 1082–1103. doi: 10.1037/0021-9010.93.5.1082

Chiaburu, D. S., Lorinkova, N. M., and Van Dyne, L. (2013). Employees' social context and change oriented citizenship: a meta-analysis of leader, coworker, and organizational influences. *Group Organ. Manage.* 38, 291–333. doi: 10.1177/1059601113476736

Donaldson, S. I., Chan, L. B., Villalobos, J., and Chen, C. L. (2020). The generalizability of HERO across 15 nations: positive psychological capital (PsyCap) beyond the US and other WEIRD countries. *Int. J. Environ. Res. Public Health* 17. doi: 10.3390/ijerph17249432

Giancaspro, M. L., Callea, A., and Manuti, A. (2022). "I Like It like That": A study on the relationship between psychological capital, work engagement and extra-role behavior. *Sustainability*, 14. doi: 10.3390/su14042022

Glavas, A., and Kelley, K. (2014). The effects of perceived corporate social responsibility on employee attitudes. *Bus. Ethics Q.* 24, 165–202. doi: 10.5840/beq20143206

Gond, J. P., El Akremi, A., Swaen, V., and Babu, N. (2017). The psychological microfoundations of corporate social responsibility: a person-centric systematic review. *J. Organ. Behav.* 38, 225–246. doi: 10.1002/job.2170

Hicklenton, C., Hine, D. W., and Loi, N. M. (2019). Can work climate foster pro-environmental behavior inside and outside of the workplace? *PloS ONE* 14. doi: 10.1371/journal.pone.0223774

Hobfoll, S. E. (1989). Conservation of resources: a new attempt at conceptualizing stress. *The Am. Psychol.* 44, 513–524. doi: 10.1037/0003-066X.44.3.513

Hu, L., and Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct. Equat. Model.* 6, 1–55. doi: 10.1080/10705519909540118

Islam, T., Ali, G., and Asad, H. (2019). Environmental CSR and pro-environmental behaviors to reduce environmental dilapidation: the moderating role of empathy. *Manag. Res. Rev.* 42, 332–351. doi: 10.1108/MRR-12-2017-0408

Jimmieson, N., Terry, D., and Callan, V. (2004). A longitudinal study of employee adaptation to organizational change: the role of change-related information and change-related self-efficacy. *J. Occup. Health Psychol.* 9, 11–27. doi: 10.1037/1076-8998.9.1.11

Jin, X., Qing, C., and Jin, S. (2022). Ethical leadership and innovative behavior: mediating role of voice behavior and moderated mediation role of psychological safety. *Sustainability* 14, 5125. doi: 10.3390/su14095125

Johnson, R. E., Rosen, C. C., and Djurdjevic, E. (2011). Assessing the impact of common method variance on higher order multidimensional constructs. *J. Appl. Psychol.* 96, 744–761. doi: 10.1037/a0021504

Jöreskog, K. G., and Sörbom, D. (1993). *Lisrel 8: Structural Equations Modeling With SIMPLIS Command Language*. Hillsdale, NJ: Erlbaum.

Jungert, T., Van den Broeck, A., Schreurs, B., and Osterman, U. (2018). How colleagues can support each other's needs and motivation: An intervention on employee work motivation. *J. App. Psychol.: Int. Rev.* 67, 3–29. doi: 10.1111/apps.12110

Kline, R. B. (2016). *Principles and Practice of Structural Equation Modelling.* 4th ed. New York, NY: Guilford Press.

Lasrado, F., and Zakaria, N. (2020). Go green! Exploring the organizational factors that influence self-initiated green behavior in the United Arab Emirates. *Asia Pacific J. Manage.* 37, 823–850. doi: 10.1007/s10490-019-09665-1

Lee, M. C. C., and Lunn, J. (2019). Testing the relevance, proximal, and distal effects of psychosocial safety climate and social support on job resources: a context-based approach, *Cogent Psychol.* 6, 1685929. doi: 10.1080/23311908.2019.1685929

Lesener, T., Gusy, B., and Wolter, C. (2019). The job demands-resources model: a meta-analytic review of longitudinal studies. *Work Stress.* 33, 76–103. doi: 10.1080/02678373.2018.1529065

Lorenz, T., Beer, C., Koch, J., and Heinitz, K. (2016). Measuring psychological capital: construction and validation of the compound PsyCap scale (CPC-12). *PloS ONE.* 11, e0152892. doi: 10.1371/journal.pone.0152892

Luthans, F., and Avolio, B. J. (2006). Psychological capital development: toward a micro-intervention. *J. Organ. Behav.* 27, 387–393. doi: 10.1002/job.373

Luthans, F., Avolio, B. J., Avey, J. B., and Norman, S. M. (2007). Positive psychological capital: measurement and relationship with performance and satisfaction. *Pers. Psychol.* 60, 541–572. doi: 10.1111/j.1744-6570.2007.00083.x

Maes, G., and Van Hootegem, G. (2019). A systems model of organizational change. *J. Organ. Chang. Manage.* 32, 725–738. doi: 10.1108/JOCM-07-2017-0268

Magill, M. S., Yost, P. R., Chighizola, B., and Stark, A. (2020). Organizational climate for climate sustainability. *Consult. Psychol. J. Practice Res.*, 72, 198–222. doi: 10.1037/cpb0000163

Marsh, H. W. (1987). The hierarchical structure of self-concept and the application of hierarchical confirmatory factor analysis. *J. Ed. Meas.* 24, 17–39. doi: 10.1111/j.1745-3984.1987.tb00259.x

Marsh, H. W., and Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: first-and higher order factor models and their invariance across groups. *Psychol. Bull.* 97, 562–582. doi: 10.1037/0033-2909.97.3.562

Mazetti, G., Robledo, E., Vignoli, M., Topa, G., Guglielmi, D., and Schaufeli, W. B. (2021). Work engagement: a meta-analysis using the job demands-resources model. *Psychol. Reports* 1–38. doi: 10.1177/00332941211051988

McNeish, D., and Wolf, M. G. (2021). Dynamic fit index cut-offs for confirmatory factor analysis models. *Psychol. Methods.* 28, 61–88. doi: 10.31234/osf.io/rve58

Newman, A., Ucbasaran, D., Zhu, F., and Hirst, G. (2014). Psychological capital: a review and synthesis. *J. Organ. Behav.* 35, 120–138. doi: 10.1002/job.1916

Ng, T. W. H., and Sorensen, K. L. (2018). Toward a further understanding of the relationships between perceptions of support and work attitudes: a meta-analysis. *Group Organ. Manage.* 33, 243–268. doi: 10.1177/1059601107313307

Nisar, Q. A., Akbar, A., Naz, S., Haider, S. A., Poulova, P., and Hai, M. A. (2022). Greening the workforce: a strategic way to spur the environmental performance in the hotel industry. *Front. Environ. Sc.* 10, 841205. doi: 10.3389/fenvs.2022.841205

Norton, T. A., Parker, S. L., Zacher, H., and Ashkanasy, N. M. (2015). Employee green behavior: a theoretical framework, multilevel review, and future research agenda. *Organ. Environ.* 28, 103–125. doi: 10.1177/1086026615575773

Norton, T. A., Zacher, H., and Ashkanasy, N. M. (2014). Organizational sustainability policies and employee green behaviour: the mediating role of work climate perceptions. *J. Environ. Psychol.* 38, 49–54. doi: 10.1016/j.jenvp.2013.12.008

Nunnally, J. C., and Bernstein, I. H. (1994). *Psychometric Theory*. New York, NY: McGraw-Hill.

Paillé, P., Boiral, O., and Chen, Y. (2013). Linking environmental management practices and organizational citizenship behaviour for the environment: a social exchange perspective. *Int. J. Hum. Resour. Manag.* 24, 3552–3575. doi: 10.1080/09585192.2013.777934

Podsakoff, P. M., MacKenzie, S. B., and Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annu. Rev. Psychol.* 63, 539–569. doi: 10.1146/annurev-psych-120710-100452

Shah, T. A., Parray, Z. A., and Islam, S. (2023). The empirical relationship between transformational leadership and job attitudes: mediating role of psychological capital – a study of healthcare in India. *Int. J. Public Leadership*. 19, 45–63. doi: 10.1108/IJPL-07-2022-0042

Simpson, M. R. (2009). Engagement at work: a review of the literature. *Int. J. Nursing Stud.* 46, 1012–1024. doi: 10.1016/j.ijnurstu.2008.05.003

Soper, D. (2022). *A-priori Sample Size Calculator for Structural Equation Models*. Available online at: https://www.danielsoper.com/statcalc (accessed December, 2022).

Sweetman, D., and Luthans, F. (2010). The power of positive psychology: psychological capital and work engagement. In: Bakker, A. B., and Leiter, M. P., editors. *Work Engagement: A Handbook of Essential Theory and Research*. London: Psychology Press. p. 54–68.

Termeer, C. J. A. M., Dewulf, A., and Biesbroek, G. R. (2017). Transformational change: governance interventions for climate change adaptation from a continuous change perspective. *J. Env. Plan. Manage.* 60, 558–576. doi: 10.1080/09640568.2016.1168288

Thompson, C. G., Kim, R. S., Aloe, A. M., and Becker, B. J. (2017). Extracting the variance inflation factor and other multicollinearity diagnostics from typical regression results. *Basic Appl. Soc. Psychol.* 39, 81–90. doi: 10.1080/01973533.2016.1277529

Tian, H., Zhang, J., and Li, J. (2020). The relationship between pro-environmental attitude and employee green behavior: the role of motivational states and green work climate perceptions. *Environ. Sci. Pollution Res.* 27, 7341–7352. doi: 10.1007/s11356-019-07393-z

Tonidandel, S., and LeBreton, J. M. (2014). RWA web: a free, comprehensive, web-based, and user-friendly tool for relative weight analyses. *J. Bus. Psychol.* 30, 207–216. doi: 10.1007/s10869-014-9351-z

Truong, T. V. T., Nguyen, H. V., and Phan, M. C. T. (2021). Influences of job demands, job resources, personal resources, and coworkers support on work engagement and creativity. *J. Asian Fin. Econom. Bus.* 8, 1041–1050. doi: 10.13106/jafeb.2021.vol8.no1.1041

Unsworth, K. L., Davis, M. C., Russell, S. V., and Bretter, C. (2021). Employee green behaviour: how organizations can help the environment. *Curr. Opin. Psychol.* 42, 1–6. doi: 10.1016/j.copsyc.2020.12.006

Unsworth, K. L., and McNeill, I. M. (2017). Increasing pro-environmental behaviors by increasing self-concordance: testing an intervention. *J. Appl. Psychol.* 102, 88–103. doi: 10.1037/apl0000155

Vilariño del Castillo, D., and Lopez-Zafra, E. (2021). Antecedents of psychological capital at work: a systematic review of moderator-mediator effects and a new integrative proposal. *Eur. Manage. Rev*. 19, 154–169. doi: 10.1111/emre.12460

Walter, S. L., Seibert, S. E., Goering, D., and O'Boyle, E. H. (2019). A tale of two sample sources: do results from online panel data and conventional data converge? *J. Bus. Psychol.* 34, 425–452. doi: 10.1007/s10869-018-9552-y

Xanthopoulou, D., Bakker, A. B., and Fischbach, A. (2013). Work engagement among employees facing emotional demands: the role of personal resources. *J. Personal. Psychol.* 12, 74–84. doi: 10.1027/1866-5888/a000085

Yuriev, A., Boiral, O., Francoeur, V., and Paill,é, P. (2018). Overcoming the barriers to pro-environmental behaviors in the workplace: a systematic review. *J. Clean. Prod.* 182, 379–394. doi: 10.1016/j.jclepro.2018.02.041

Zhang, Z., Wang, J., and Jia, M. (2021). Integrating the bright and dark sides of corporate volunteering climate: is corporate volunteering climate a burden or boost to employees? *Brit. J. Manage.* 32, 494–511. doi: 10.1111/1467-8551.12418