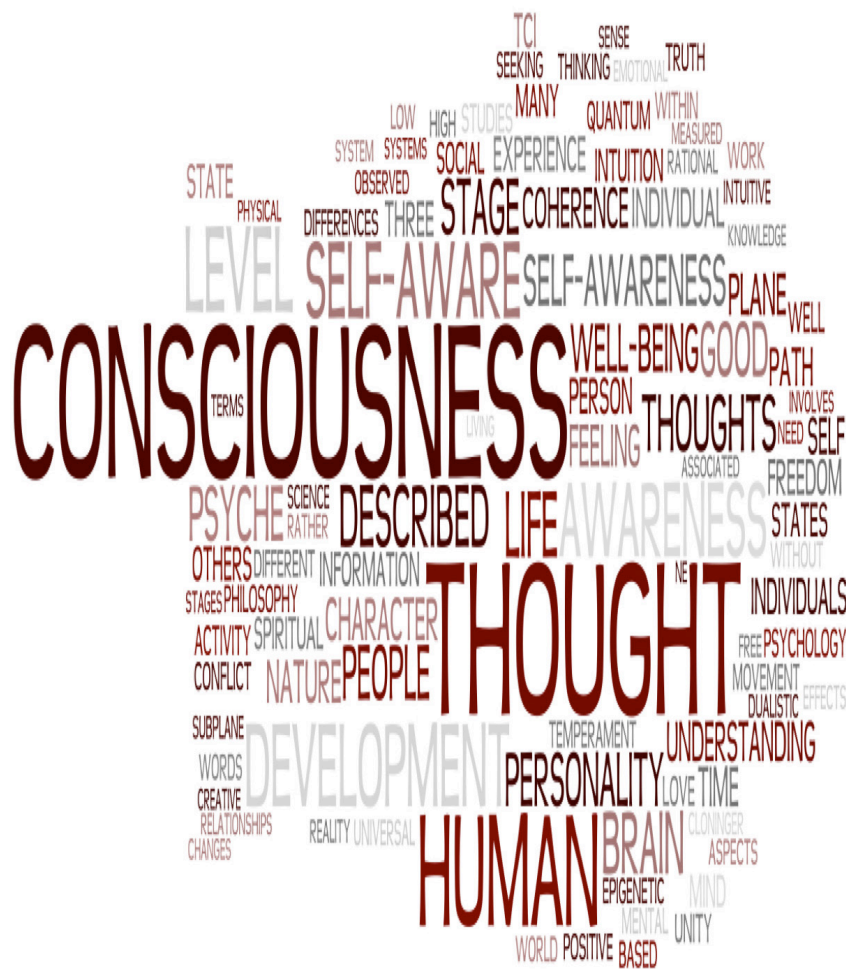# CHARACTER, RESPONSIBILITY, AND WELL-BEING: INFLUENCES ON MENTAL HEALTH AND CONSTRUCTIVE BEHAVIOR PATTERNS

**EDITED BY : Danilo Garcia, Trevor Archer and
Ann-Christine Andersson Arntén**

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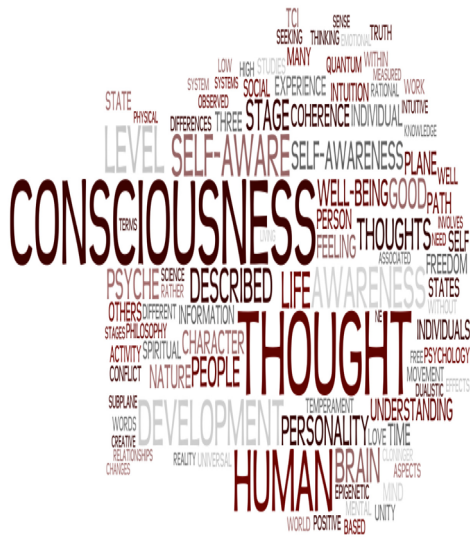
CHARACTER, RESPONSIBILITY, AND WELL-BEING: INFLUENCES ON MENTAL HEALTH AND CONSTRUCTIVE BEHAVIOR PATTERNS

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Most common words from the book "The Science of Well-Being" by C. R. Cloninger. The word cloud was created using http://www.wordle.net

Character can be defined as self-aware knowledge that helps the individual to set goals, values and ethical principles (Cloninger, 2004). This meta-cognitive dimension of human personality involves 'Theory of Mind', and is positively related to measures of well-being, mental health, and constructive behavior patterns. Research from at least three different fields, cultural (Shweder, Much, Mahapatra & Park, 1997), personality (Cloninger, 2004), and social psychology (Abele & Wojcizke, 2007) suggest that character can be organized along three broad principles: agency, which is related to the autonomy and the fulfillment and enhancement of the self; communion, which is related to engagement in the protection and relations to others such as families, companies or nations; and spirituality, which is related to the human ability to transcend the self and find and interconnection with all life and appreciation of the whole world around us (Haidt, 2006; Cloninger, 2013).

Using the Temperament and Character Inventory (Cloninger, Svrakic & Przybeck, 1993) researchers have found that agentic (i.e., Self-directedness) and communal (i.e., Cooperativeness) values are associated to high levels of happiness, psychological well-being, and less violent behavior. Moreover, low Self-directedness and Cooperativeness is recurrent among individuals with all types of mental health problems, such as, depression, schizophrenia, anxiety disorder, autism spectrum disorders, attention deficit/hyperactivity disorder and etcetera. Spirituality, in coherence with agency and communion, guides the individual to seek self-realization in harmony with others and nature in the changing world (Cloninger, 2013). Seeing character as self-awareness of the self in three dimensions has also been associated to human responsibility and empowerment.

This research topic will focus on all article types that put forward findings regarding:

- Character as a protective factor against mental illness.
- Character's association to conduct disorders and violent behavior.
- Character as a promoter of happiness, life satisfaction, and well-being.
- The etiology of character.
- Longitudinal studies on character.
- Agency, communion, and spirituality as broad dimensions for the conceptualization of positive measures of mental health.
- Innovative methods to measure or conceptualize character.
- Non-linear effects of character on mental health.
- Character as a measure/conceptualization of responsibility.
- Character in school and work place settings.
- Character in relation to empowerment.

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The Science of Well-Being

Editorial: Character, responsibility, and well-being: influences on mental health and constructive behavior patterns

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Character can be defined as self-aware knowledge that helps the individual to set goals, values, and ethical principles (Cloninger, 2004). This meta-cognitive dimension of human personality involves "Theory of Mind," and is positively related to measures of well-being, mental health, and constructive behavior patterns. Research from at least three different fields, cultural (Shweder et al., 1997), personality (Cloninger, 2004), and social psychology (Abele and Wojciszke, 2007) suggest that character can be organized along three broad principles: agency, which is related to the autonomy and the fulfillment and enhancement of the self; communion, which is related to engagement in the protection and relations to others such as families, companies or nations; and spirituality, which is related to the human ability to transcend the self and find and interconnection with all life and appreciation of the whole world around us (Haidt, 2006; Cloninger, 2013).

Using the Temperament and Character Inventory (Cloninger et al., 1993) researchers have found that Self-directedness (i.e., agency), Cooperativeness (i.e., communion), and Self-transcendence (i.e., Spirituality) are associated to high levels of happiness, psychological well-being, and less violent behavior (Garcia et al., 2013, 2015; Nima and Garcia, 2015; Mousavi et al., 2015). Moreover, low Self-directedness and Cooperativeness is recurrent among individuals with all types of mental health problems, such as, depression, schizophrenia, anxiety disorder, autism spectrum disorders, attention deficit/hyperactivity disorder, and etcetera. Self-transcendence, in coherence with Self-directedness and Cooperativeness, guides the individual to seek self-realization in harmony with others and nature in the changing world (Cloninger, 2013). Seeing character as self-awareness of the self in three dimensions has also been associated to human responsibility and empowerment (Nima et al., 2012; Schütz et al., 2013a,b; Cloninger and Garcia, 2015).

In this Research Topic researchers offer their perspective on character, responsibility, and well-being. Ruch and his colleagues, using other measures for character, offer a series of articles ranging from life satisfaction among religious people (Berthold and Ruch, 2014) to good character in school (Wagner and Ruch, 2015). Abele develops the idea of how communal values need to be pursued in agentic ways (Abele, 2014), while Garcia and his colleagues give an insight into the possible use of character-centered teams at work places (e.g., Garcia et al., 2014a) and also its etiology in adolescence (Garcia et al., 2014b). Continuing this line, Jeppsson (2014) gives a philosophical perspective on responsibility in the field of criminal justice. Finally, Moreira et al. (2015) show the importance of character and its relation to well-being during adolescence, while Nilsson (2014) gives a critical opinion of the need of

introducing the perspective of worldview when studying the association between personality and well-being.

With this range of different takes on the interactions between character, responsibility and well-being we hope to give a new perspective on the investigation of personality's role on human health and well-being.

Acknowledgments

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Conflict of Interest Statement: 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.

Mapping strengths into virtues: the relation of the 24 VIA-strengths to six ubiquitous virtues

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The Values-in-Action-classification distinguishes six core virtues and 24 strengths. As the assignment of the strengths to the virtues was done on theoretical grounds it still needs empirical verification. As an alternative to factor analytic investigations the present study utilizes expert judgments. In a pilot study the conceptual overlap among five sources of knowledge (strength's name including synonyms, short definitions, brief descriptions, longer theoretical elaborations, and item content) about a particular strength was examined. The results show that the five sources converged quite well, with the short definitions and the items being slightly different from the other. All strengths exceeded a cut-off value but the convergence was much better for some strengths (e.g., zest) than for others (e.g., perspective). In the main study 70 experts (from psychology, philosophy, theology, etc.) and 41 laypersons rated how prototypical the strengths are for each of the six virtues. The results showed that 10 were very good markers for their virtues, nine were good markers, four were acceptable markers, and only one strength failed to reach the cut-off score for its assigned virtue. However, strengths were often markers for two or even three virtues, and occasionally they marked the other virtue more strongly than the one they were assigned to. The virtue prototypicality ratings were slightly positively correlated with higher coefficients being found for justice and humanity. A factor analysis of the 24 strengths across the ratings yielded the six factors with an only slightly different composition of strengths and double loadings. It is proposed to adjust either the classification (by reassigning strengths and by allowing strengths to be subsumed under more than one virtue) or to change the definition of certain strengths so that they only exemplify one virtue. The results are discussed in the context of factor analytic attempts to verify the structural model.

Keywords: character strengths, virtues, VIA-classification, prototypicality, model testing, positive psychology

Introduction

Both virtues and strengths form essential ingredients of the model of character put forward by Peterson and Seligman (2004). The study of various writings of philosophers and spiritual leaders in China, South Asia, and the West led to the postulate of six ubiquitous core virtues, namely courage, justice, humanity, temperance, wisdom, and transcendence (Dahlsgaard et al., 2005). Virtues are seen as the core characteristics valued by moral philosophers and religious thinkers. Peterson and Seligman (2004) argued that these virtues are universal, perhaps grounded in biology through an evolutionary process that selected for these aspects of excellence

as means of solving the important tasks necessary for survival of the species. They chose not to measure the virtues as these are too abstract but put the emphasis on character strengths.

Character strengths were defined as the examples or instances of the virtues. Peterson and Seligman (2004, p. 13) write that character strengths are "[...] the psychological ingredients – processes or mechanisms – that define the virtues. Said another way, they are distinguishable routes to displaying one or another of the virtues. For example, the virtue of wisdom can be achieved through creativity, curiosity etc. [...] These strengths are similar in that they all involve the acquisition and use of knowledge, but they are also distinct." Of lower abstraction is the next level of the good character, namely situational themes. Situational themes are defined as the specific habits that lead people to manifest given character strengths in given situations, be it work-related or in family. The situational conditions that enable or disable strengths have not been studied a lot. Thus, Peterson and Seligman (2004) found it useful to recognize the components of the good character as existing at different levels of abstraction. In this sense the classification scheme is not exclusively horizontal (i.e., distinguishing among virtues or strengths) but also vertical (i.e., specifying different conceptual levels in a hierarchy).

The entries for the classification were found in a separate step. The number of strengths was increased in several steps from 20 to finally 24. In order to qualify as a character strength, a positive trait needed to fulfill several criteria, such as ubiquity (i.e., it is widely recognized across cultures); being fulfilling (i.e., it contributes to individual fulfillment, satisfaction, and happiness broadly construed); being morally valued (i.e., it is valued in its own right and not as a means to an end); not diminishing others (i.e., it elevates others who witness it, producing admiration, not jealousy); having a non-felicitous opposite (i.e., it has obvious antonyms that are "negative," not also positive); being trait-like (i.e., it is an individual difference with demonstrable generality and stability); measurable (i.e., it has been successfully measured by researchers as an individual difference); its distinctiveness (i.e., it is not conceptually or empirically redundant with other character strengths); the existence of paragons (i.e., it is strikingly embodied in some individuals), and prodigies (i.e., it is precociously shown by some children or youths); the possibility of its selective absence (i.e., it is missing altogether in some individuals, institutions); and larger societies have provided institutions or have developed rituals for fostering the strengths (i.e., it is the deliberate target of societal practices and rituals that try to cultivate it). Peterson and Seligman (2004, p. 18) argue that people typically have between three to seven so-called signature strengths; i.e., "[...] strengths that a person owns, celebrates, and frequently exercises." Further they list ten possible criteria for a signature strength such as a sense of ownership and authenticity, a feeling of excitement when displaying the strength, or a rapid learning curve for topics associated with the strength. There is broad evidence from placebo-controlled intervention studies that focusing on signature strengths over the course of 1 week has a beneficial impact on happiness and depression (Seligman et al., 2005; for an overview see also Proyer et al., 2015). The final model of strengths and virtues is displayed in **Table 1**.

TABLE 1 | The six virtues and 24 character strengths included in the Values in Action classification of strengths and short descriptions defining the strengths and virtues (adapted from Peterson and Seligman, 2004).

(1) *Wisdom and knowledge*: cognitive strengths that entail the acquisition and use of knowledge.

- *Creativity*: thinking of novel and productive ways to do things
- *Curiosity*: taking an interest in all of ongoing experience
- *Open-mindedness*: thinking things through and examining them from all sides
- *Love of learning*: mastering new skills, topics, and bodies of knowledge
- *Perspective*: being able to provide wise counsel to others

(2) *Courage*: emotional strengths that involve the exercise of will to accomplish goals in the face of opposition, external or internal.

- *Authenticity*: speaking the truth and presenting oneself in a genuine way
- *Bravery*: *not* shrinking from threat, challenge, difficulty, or pain
- *Persistence*: finishing what one starts
- *Zest*: approaching life with excitement and energy

(3) *Humanity*: interpersonal strengths that involve "tending and befriending" others.

- *Kindness*: doing favors and good deeds for others
- *Love*: valuing close relations with others
- *Social intelligence*: being aware of the motives and feelings of self and others

(4) *Justice*: civic strengths that underlie healthy community life.

- *Fairness*: treating all people the same according to notions of fairness and justice
- *Leadership*: organizing group activities and seeing that they happen
- *Teamwork*: working well as member of a group or team

(5) *Temperance*: strengths that protect against excess.

- *Forgiveness*: forgiving those who have done wrong
- *Modesty*: letting one's accomplishments speak for themselves
- *Prudence*: being careful about one's choices; *not* saying or doing things that might later be regretted
- *Self-regulation*: regulating what one feels and does

(6) *Transcendence*: strengths that forge connections to the larger universe and provide meaning.

- *Appreciation of beauty and excellence*: noticing and appreciating beauty, excellence, and/or skilled performance in all domains of life
- *Gratitude*: being aware of and thankful for the good things that happen
- *Hope*: expecting the best and working to achieve it
- *Humor*: liking to laugh and tease; bringing smiles to other people
- *Spirituality*: having coherent beliefs about the higher purpose and meaning of life

The six core virtues are constituted by three to five character strengths, and the assignment of the strengths to the virtue categories was done on theoretical grounds as opposed to empirically. Later, attempts to examine the model by utilizing factor analysis of the 24 strengths were put forward, but failed to find the proposed six factors. More frequently a solution with five factors has been described—occasionally much to the disappointment of the authors (for a review, see e.g., McGrath, 2014; see also Ruch et al., 2010). In the present manuscript we will first examine the model of the good character closer and then suggest performing an alternative test for its structure.

Some Testable Assumptions in the Character Model

There are a variety of testable (and partly yet untested) assumptions associated with the VIA-classification. One relates

to the condensation of the sources studied by Dahlsgaard et al. (2005) to the "high six." Would other researchers studying the same writings arrive at the same six core values? Typically, in such a study one would expect an index of convergence among coders. Thus, a valuable but maybe strenuous task would be to go through the literature and cluster the virtues lists or to rate for each of the entries of the virtue lists studied to the degree of prototypicality of each of the virtues. This will help confirming the validity of the selection of virtues in the VIA-model. It should be mentioned that alternative approaches exist to define virtues factors, namely through a psycho-lexical approach (e.g., De Raad and Van Oudenhoven, 2011). Here a longer list of virtue terms from the dictionary is administered to participants for self-report. Virtue factors are then extracted from the intercorrelation of terms administered for self-description. Thus, for example, a virtue factor of "humanity" is dependent on the existence of a sufficient number of other terms that are related to humanity (i.e., related concepts, variants, facets) and of individuals systematically differing in the endorsement of the terms representing these concepts. In other words, humanity, like other classic virtues, would only emerge as a *factor of humanity* if enough *everyday terms* exist that somehow reflect humanity.

A second testable element is the overall relation between strengths/virtues and the "good character." Peterson and Seligman (2004, p. 13) speculate that all of these virtues must be present at above-threshold values for an individual to be deemed of good character and state that "[a]gain, we regard these strengths as ubiquitously recognized and valued, although a given individual will rarely if ever display all of them. We are comfortable saying that someone is of good character if he or she displays but 1 or 2 strengths within a virtue group." This assertion contains several elements and challenges. One element to be tested is the perception that the goodness of the character reaches its maximum (and does not progress anymore from there) when all six (rather than merely various combinations of five—or less) virtues are saliently present. This is also based on the assumption that all virtues are needed for a "good character" and that the present list of six is sufficient. In fact, the weight of each of the virtues in the definition of the "good character" could be empirically determined. It will be of interest to see then the distribution of a random sample of adults on such a goodness dimension; i.e., how many have all six virtues above threshold, how many five and so on. A core challenge is to define and validate a criterion for the presence of a strength. What expression of the strengths is needed to speak of "above-threshold values"? Next, the needed critical mass of strengths within a virtue group could be determined empirically as well. Clearly there would be different types of research strategies (e.g., perception studies, predicting criterion behavior) to answer this question. One might also argue that it is not useful to apply the notion of good character to individuals at all but only to the family of strengths and virtues that define it at a conceptual level.

A third possible test examines the relation between character strengths and virtues. As mentioned before, virtually everyone working with the standard instrument for the subjective assessment of character strengths, the *Values-in-Action Inventory of*

Strengths (VIA-IS; Peterson et al., 2005), thus far was performing a factor analysis (or principal component analysis, or confirmatory factor analysis) to examine whether the respective strength loads on the virtue factor it was "assigned" to. It should be noted though that nowhere in the original work it is stated that the VIA-classification represents a factor model of character where the virtues are derived from the intercorrelation of the strengths. Occasionally, factor analyses of the strengths are performed with the expectation to arrive at the virtues proposed by Peterson and Seligman (2004), and then the loading of a strength on these factors is taken as a criterion that the strength indeed belongs to the virtue. Peterson and Seligman (2004) do not explicitly specify how their model should be adequately tested, but two strategies seem to be compatible with their writings. Several statements seem to speak against the idea that solely the intercorrelations among the strengths should be used to define the virtues; this is when they write that processes or mechanisms defining the virtues, or distinguishable routes to displaying one or another of the virtues, and that "a given individual will rarely, if ever, display all of them" (Peterson and Seligman, 2004, p. 13). Having to display only one or two strengths in a virtue group implies that being high in some of the strengths of a virtue does not necessarily mean that one needs to be high in other strengths as well to have that strength subsumed under the same virtue. This is plausible, as one might argue that there are several different routes to wealth (such as inheriting money/property, working hard, robbing a bank, gambling successfully, marrying rich, etc.) that do not need to be pursued by the same person to the same extent to make them intercorrelate and form a factor. So these statements clearly indicate that no strict factor model of character is implied. However, in the same book, Peterson and Seligman (2004, p. 26) also mention that correlations with other strengths might serve as a criterion; they note: "We measured only the strengths, and if the data suggest—for example—that playfulness belongs elsewhere because of its co-occurrence with other strengths, we will gladly move it." Here the other strengths (and the co-occurrence with them) are used as a criterion for belonging rather than its conceptual relation with the virtue (i.e., being a process or mechanism). Nevertheless, while occasionally factor analyses of the VIA-scales have been conducted by these researchers, the outcome of the studies were not meant to change the classification—rather they can be seen as an investigation of the factor structure of a questionnaire. There were discussions to collapse strengths based on the factor analyses to avoid redundancy though (Park and Peterson, 2005). These researchers found four to five factors in the instruments for adults and children/adolescents or a two-factor solution when using ipsative scores (Peterson, 2006).

If factor analysis is not the golden path to test the model what is? For this we need to look into the nature of the model applied. First, it needs to be noted that the hierarchical classification of positive characteristics put forward was modeled on the Linnaean classification of species, which also ranges from the concrete and specific (the individual organism) through increasingly abstract and general categories (population, subspecies, species, genus, family, order, class, phylum, kingdom, and domain). Peterson and Seligman (2004) distinguish the three

conceptual levels of situational themes (most specific), character strengths (intermediate), and virtues (most global). Thus, applying Linnaean thinking one would need to specify what attributes of the strengths (or situational themes) might be used in their conceptual classification—and not *individual differences* in the strengths (as essential for factor analytic models). Thus, this assumption needs to be tested conceptually; for example, in a first step by asking experts how good a strength is as an example for each of the six virtues; i.e., into what branch of virtue a strength falls.

The last of the testable assumptions sounds most important as it might provide an alternative to the prior testing of the model. Hence, the present manuscript will examine how good an example each of the 24 strengths is for the six virtues. The major prerequisite for such a study is tested in a pilot study that is aimed at making sure that the different domains of information (e.g., names of the strengths, items, theories of the strengths) are consistent. This is important to know to be able to select the appropriate source of information about a strength to be related to the virtues.

Pilot Study: Convergence of Indicators of the Strengths

The aim of the pilot study is to examine the degree of conceptual overlap among several domains of information about signature strengths. It is important to ascertain for each character strength that there is a sufficiently high coherence between different sources of knowledge about the strengths. The information examined in the present study includes the names of the strengths including synonyms (e.g., Creativity [originality, ingenuity]), the definitions of the strengths (e.g., thinking of novel and productive ways to do things), brief descriptions of the strengths (e.g., as provided in the feedback to the test takers), a longer theoretical elaboration of the strengths, and the actual item contents. A pairwise comparison among all possible pairs of the five elements will tell whether all five domains cover the strengths (a) sufficiently well, (b) are equal or differently well suited, and (c) whether all strengths are sufficiently coherent, and (d) some strengths are more consistent than others.

Materials and Methods

Participants
The sample consisted of 20 German-speaking adults (16 female, 4 male) that served as expert raters. Their mean age was 28 years (ranging from 17 to 49 years). They were either students of psychology or currently working on their Ph.D. in psychology. Eight of them were already familiar with the VIA classification.

Instruments
Strength Definition Comparison Task
Participants were provided with a two page sheet for each strength. The first one contained five different sources of information for the strength, and the second the instruction and

10 rating scales. The five domains of information were (a) the German (and English) names of the scales (including the synonyms), e.g., Creativity (originality, ingenuity), (b) the short definition of the respective strength (e.g., "thinking of novel and productive ways to do things"), (c) a short description of the high scorer (the text was taken from the feedback to the participants that complete the VIA-IS and typically contained between 2 and 5 lines), (d) a more elaborate description of the strengths taken from Peterson and Seligman's (2004) original work (between 7 and 11 lines), and (e) the actual 10 items from the VIA-IS used to measure this strength. They were instructed to study the five sources and then to perform 10 pairwise comparisons of the five domains regarding the degree of overlap of the two sources. This was done on an 11-point scale with anchored steps (0 = not at all similar, 2 = somewhat similar, but strong conceptual differences, 4 = similar but conceptually different, 6 = similar but not completely identical, 8 = very similar, and 10 = completely identical).

Procedure and Data Analysis
Data were collected through paper-and-pencil administration. Participants were instructed to do these 240 pairwise comparisons on their own, at their own tempo, and they should take a break if needed. Both the order of strengths and the order of the 10 comparisons of strengths were counterbalanced. Participants were provided with a page with the instructions and the material, and on a separate page they did perform the pairwise comparisons. The task lasted about 2^1/$_2$ h. Participants were not remunerated for their efforts. Data were then averaged to get the 240 mean scores for each pairwise comparison and the strengths. They were then further averaged sequentially (across the comparisons, across strengths) to get scores for the 24 strengths, the five domains, and the 10 types of comparisons.

Results and Discussion

The grand average of all comparisons was 7.1 indicating that overall there was a considerable overlap, which can be described as being midway between "similar" and "very similar." This is a high level of coherence in the description of the strengths. At the next lower level of aggregation two types of information can be examined, namely how the conceptual overlap among five sources of knowledge is for each strength (see **Table 2**, last column) and how strongly each of the five domains overlaps on average with the others (see **Table 2**, last row). Finally, the pairwise overlap between the five domains (collapsed over the strengths) is shown in **Table 3**.

The level of convergence regarding the strengths ranged from 6.2 (i.e., more than "similar") to 7.8 (i.e., almost "very similar"). This demonstrates that the strengths were more or less consistently described as they are. However, if an improvement in convergence of descriptions is sought, **Table 2** also lists the strengths where improvement is possible (e.g., creativity, love of learning, leadership, modesty, and perspective), while for other strengths (i.e., zest, humor, appreciation of beauty and excellence, open-mindedness, gratitude) the convergence was already very good.

TABLE 2 | Mean similarity of sources of information about the strength as derived from the pairwise comparisons.

	Label	Definition	Feedback	Description	Items	Total
Perspective	6.4	5.7	6.6	6.6	5.7	6.2
Modesty	6.5	6.0	6.6	6.7	6.4	6.4
Leadership	6.8	5.9	6.8	7.0	6.3	6.5
Love of learning	6.9	5.8	7.0	6.9	6.8	6.7
Creativity	6.9	6.5	7.1	6.7	6.5	6.7
Bravery	6.8	6.7	7.0	6.9	6.5	6.8
Honesty	7.1	6.5	6.8	6.9	6.6	6.8
Love	7.2	6.3	7.0	7.2	6.7	6.9
Teamwork	6.4	6.6	7.0	7.3	7.0	6.9
Kindness	6.8	6.7	7.2	7.0	6.8	6.9
Prudence	7.5	6.8	7.2	7.2	6.5	7.0
Persistence	7.2	6.8	7.1	7.2	7.2	7.1
Curiosity	7.4	6.8	7.4	7.4	7.1	7.2
Self-regulation	7.5	7.0	7.5	7.3	6.9	7.2
Fairness	7.3	7.3	7.4	7.2	7.1	7.3
Hope	7.5	7.3	7.1	7.3	7.2	7.3
Spirituality	7.4	7.1	7.3	7.5	7.2	7.3
Forgiveness	7.7	7.3	7.5	7.1	7.1	7.3
Social Intelligence	7.7	7.0	7.4	7.4	7.2	7.3
Gratitude	7.8	7.2	7.3	7.4	7.3	7.4
Open-mindedness	7.7	7.1	7.6	7.5	7.4	7.5
Beauty and excellence	7.6	7.3	7.6	7.7	7.2	7.5
Humor	7.6	7.2	7.6	7.8	7.7	7.6
Zest	7.9	7.9	7.8	7.7	7.7	7.8
Total	7.2	6.8	7.2	7.2	6.9	7.1

TABLE 3 | Mean convergence between the five descriptions of the strengths.

	A	B	C	D	E
A (scale labels)	10.0	6.8	7.5	7.6	7.0
B (one-line definitions)		10.0	7.0	6.8	6.5
C (descriptions in feedback)			10.0	7.3	7.0
D (elaborated descriptions)				10.0	7.2
E (item contents)					10.0

Likewise, the five sources of information about the strengths overlap very well with the others (**Table 2**, last row). Nevertheless, the labels (names, plus synonyms; 7.2), the shorter (7.2) and longer (7.2) descriptions of the strengths yielded high average scores in similarity being again midway between "similar" and "very similar." The unexpected result was that the labels of the scales yielded the same scores as the description of the strengths (as in the feedback) and the even longer descriptions of the strengths. This might be due to the fact that the words and synonyms are properly chosen and do cover the substance of the strength well. The items yielded a somewhat lower average mean (6.9) and also the one-line *definitions* (6.8) of the strength were somewhat lower. While the variation was not large it is surprising that the items do yield the lowest score.

The inspection of the next lower level of aggregation indicates for each of the 24 strengths how the single sources of information overlap with the four remaining ones. **Table 2** (columns 2–6) confirms that the different levels of information about the strengths do converge to a sufficient to very good level. Most importantly, every single of the 240 comparisons (10 among the five resources, for 24 strengths) was above 5.0 and only four were lower than 6.0. The one-line definitions for perspective, love of learning, and leadership were lower than 6.0, as were the set of items for perspective. All the others at least exceeded the threshold (i.e., exceeded the "similar, but not identical" cut-off score). For zest all five indicators yielded high scores, and while for humor the scores were generally very high, the one-line definition was comparatively lower. For appreciation of beauty and excellence, both the one-line definitions and the items were comparatively lower (albeit still at a very high level of convergence).

Are there some sources of description that systematically converge better than others? **Table 3** shows that the one-line definitions and the item contents not only had the lower scores for convergence, they also had the lowest pairwise overlap (6.5), which, however, is still well beyond cut-off value and can be phrased as "more than similar but not conceptually identical." The highest overlap was between the labels and the longer descriptions (7.6) and it can be described as close to "very similar" (see **Table 3**).

One might consider it worrying that the items (that constitute the measuring of the strengths in the VIA-IS) yielded lower scores. However, **Table 3** shows that the 10 items not only captured well what is covered in the feedback text and in the longer description, but also converged well with the labels and

synonyms. Thus, the labels already capture what is in the items. The one-line definitions converged best with the feedback text, and comparatively lower with the other sources of information. Thus, for the main study the brief descriptions (as used in feedback to participants) will be used to represent the strengths, as they are a good compromise between brevity (of material) and the level of saturation of the respective concept.

Main study: What Strengths are Prototypical for What Virtues?

Now that it is established that the brief description of the strengths contains the relevant information about the strengths, this layer of information may be used as a representative index in a new study to get estimates of how prototypical each of the strengths is for each of the six virtues. In order to ascertain a standardized understanding of what the virtues are, the raters need to be provided with the definitions of the virtues by Peterson and Seligman (2004) and be instructed to base their judgment on these definitions even if they deviate from their own. Then a rating scale needs to be designed with anchored steps that then allow interpreting the scores. A six-point scale will be utilized and the scale will be anchored in a way, that 3.5 is the cut-off point that needs to be reached to argue that the strengths can be seen as the lower bound of prototypicality for the virtue. A score of 4 will be the lower bound for a good marker and 5 is the cut-off for being a very good marker for the virtue. The rating will include all virtues to be able to see whether the prototypicality is indeed highest for the assigned virtue.

As the six virtues were sought to be representative and distinct, there are reasons to assume that judges will be able to use these scales quite independently form each other and there will be low intercorrelations. However, a correlation between judgments of humanity and justice can be expected and there will also be an overlap between the strengths related to humanity and justice. Peterson and Seligman (2004, p. 293) note: "The entries in this virtue class [humanity] resemble those we identify as justice strengths, with the difference being that strengths of humanity and love are brought to bear in one-to-one relationships, whereas those of justice are most relevant in one-to-many relationships. The former strengths are interpersonal, the latter broadly social." With regards to justice, Peterson and Seligman (2004, p. 357) argue: "We regard strengths of justice as broadly interpersonal, relevant to the optimal interaction between the individual and the group or the community. As the group shrinks in size and becomes more personalized, the strengths of justice begin to converge with the one-on-one strengths of love discussed in the previous section. We maintain the distinction by proposing that strengths of justice are strengths *among,* whereas those of love are strengths *between,* but the difference is perhaps more of degree than kind."

This study will use experts of different fields and laypersons to directly estimate to which virtues the strengths belong. While the VIA-classification was based on the discussions among experts (in the think tanks preceding the publication), their number was limited and there was also no report on a formal procedure how

agreement was established. Also the experts were mostly psychologists, and one can argue that psychologists are not ideally suited for this task. They might understand strengths well, but virtues were not a topic in psychology at that time, and psychologists might hesitate thinking in terms of virtues, and in particular transcendence is a virtue that is unfamiliar (e.g., Allport, 1937). So it would be good to look for other types of experts as well. Philosophers are familiar with virtue catalogs, but they might doubt the validity of the transcendence category and might also not be that familiar with the strengths concept. Experts might also come from the field of theology and religious studies. They will be familiar with transcendence and not hesitate to give higher prototypicality ratings. One needs to consider that transcendence might mean different things in theology and philosophy. Besides religious studies, there are also hybrid studies, such as psychology of religion, religious education. It will be necessary to represent (personality) psychology, philosophy, and theology to get a more balanced view. Experts should be better in their assignments than laypersons although the average rating of laypersons will be valid as well. Thus, the sample should cover also laypersons and examine how they compare to experts.

It is assumed that experts will assign the strengths to the virtues in the same way as Peterson and Seligman (2004) did. As already stated deviations might occur: some strength might go under a different virtue (e.g., humor maybe may be located under humanity or wisdom, rather than transcendence) or be related to more than one virtue (e.g., social intelligence might be related to humanity and wisdom).

Materials and Methods

Participants
The sample consisted 70 experts and 41 laypersons (38.7% women). Their mean age was 41.09 years (SD = 15.95; ranging from 19 to 87 years). Regarding the expert sample larger subsets came from philosophy ($n = 20$), psychology ($n = 19$), theology ($n = 17$), and psychology/pedagogy of religion ($n = 9$).

Instruments
The Strength-Virtue Prototypicality Judgment Instrument
The instrument first contains an instruction followed by definitions of the virtues and the strengths. The descriptions of the virtues were derived from Peterson and Seligman (2004) and varied in lengths with a minimum of 30 and a maximum of 49 words. The description of the strengths were the same as in Study 1. The task was to indicate how good an example[1] the 24 strengths are for each of the six virtues using a six-point scale (1 = not at all, 2 = marginally, 3 = not very good, 4 = quite good, 5 = good, and 6 = very good). There was also an empty slot to add a further virtue and rate the degree of prototypicality.

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[1]The use of this criterion over others (e.g., whether this strength is a route to displaying a virtue, or a means for achieving virtue) was recommended by Peterson (2006).

Procedure

The study was conducted via the internet using the SurveyMonkey platform. Experts were either personality psychologists or had a strong link to virtue and came from the following fields: personality, philosophy, ethics, theology, psychology of religion, or pedagogy of theology. They were initially spotted at university websites (departments of psychology, theology, philosophy etc.), membership lists of professional societies and approached via email and asked to participate in the study. About 70% of the experts actually agreed to participate. They typically were professors in the respective field or were holding a Ph.D. and specialized in the field. Laypersons had no particular background in personality and/or virtues. Typically these were students or relatives of students. As a double check all participants were asked to indicate their level of expertise in these fields in the survey. They received no compensation for participating in the study but were promised a written summary on the main findings of the study.

Data Analysis

The main analysis will be rather simple and involve an averaging of the prototypicality scores and presenting them in a table with 6 virtues and 24 strengths. Applying the cut-off scores one can then see whether a strength is not marker (1.0–3.5) a marker (>3.5), a good marker (>4.0) or a very good marker (>5.0) for a virtue. Then we will count how many of the 24 strengths do actually mark the virtue they are assigned for and at what level. We can also see how often a strength is a marker for a virtue it was not original assigned to. One can also count how often a strength marks more than one virtue, and whether the prototypicality score is higher for the assigned virtue than for another. To examine whether expert status (experts, laypersons) matters and to remove a bias due to age and gender, a 6 × 24 ANCOVA with the six virtues and the 24 strengths on the repeated measure factors and expert status (experts, laypersons) as a grouping variable and gender and age as covariates will be computed for the prototypicality ratings. Of the possible effects only the virtue times strength interaction is of prime interest and some of the effects (e.g., covariates, interaction with covariates) are neglected altogether as the aim is only to get an estimate for a prototypicality score that is unbiased by these variables. Furthermore, similar analyses will be computed to test whether type of raters (type of expert, layperson) matters to then apply the cut-off scores and see how well the strengths mark the virtues. It is not attempted to do *post hoc* tests to see whether mean scores are significantly different (i.e., whether a strength is significantly more prototypical for one virtue than for a different virtue; or whether a virtue is more linked to one strength than to the other strength).

Two analyses will be computed to show the structure inherent in the virtues and in the strength. The results of the analyses should be valid across the other two modes (rater, and strengths or virtues). The correlations of the virtue prototypicality ratings were computed across participants and strengths, but not tested for significance. Here it will not actually be of interest to see whether a correlation is "significant" but to demonstrate that the judgments are relatively independent—with the exception of

humanity and justice. Finally, the similarity among the strengths (across raters and virtues) will be examined and analyzed in a lower dimensional space. A principal component analysis will be performed on the intercorrelations among the 24 strengths. The number of factors will be examined using the Scree test and a Varimax rotation will be performed. The resulting matrix allows investigating whether the strengths assigned to a virtue actually form a joint factor when the intercorrelations are based on the prototypicality ratings for the virtues; i.e., strengths load on the same factor when they are rated high on the same virtues. Individuals also enter into the mode analyzed but not regarding how much they possess that strength but how they see the strength-virtue connections.

Results

Prototypicality Ratings

The correlations of the prototypicality ratings for the six virtues (across participants and strengths) were computed and are presented in **Table 4**.

Table 4 shows that all intercorrelations were positive. As expected, the correlations are higher for justice and humanity; i.e., when a strength was considered prototypical for humanity it also tended to be prototypical for justice. High prototypicality for justice was also correlated with the temperance judgments. The other correlations were lower than 0.40. Thus, overall the participants discriminated well among all six virtues and they saw justice somewhat more correlated with both humanity and temperance.

How Prototypical are the Strengths for the Virtues?

A 6 × 24 ANCOVA with the six virtues and the 24 strengths on the repeated measure factors and expert status (experts, laypersons), gender and age as a grouping variable was computed for the prototypicality ratings. The covariates had no main effects ($p > 0.14$), but were involved in some interactions. The main effect of virtues was not significant [$F(5,535) = 1.119$, $p = 0.349$], and the virtue ratings did not interact with any of the three covariates ($p > 0.51$). There was a main effect for strengths [$F(23,2461) = 3.414$, $p < 0.001$, $\eta_p^2 = 0.031$], and more importantly a strengths-virtue interaction, $F(115,12305) = 4.493$, $p < 0.001$, $\eta_p^2 = 0.040$. While the strengths interacted with all covariates ($ps < 0.012$; $\eta_p^2 = 0.016$–0.022), the virtue × strength interaction did not depend on gender or expert status ($ps > 0.015$), but was moderated by age, $F(115,12305) = 1.493$, $p < 0.001$, $\eta_p^2 = 0.014$. These effects were not further explored, as they were small and seemed difficult to generalize to other studies. However, they were being controlled for in the mean prototypicality ratings presented in **Table 5**.

Table 5 shows that nine strengths were very good markers (prototypicality > 5.0) and 11 were good markers (prototypicality > 4.0) for the virtue they were assigned to. Three more exceeded the 3.5 threshold (i.e., were quite good markers) and only humor did *not* reach the threshold for being prototypical for the virtue it was assigned to (i.e., >3.5). Humor seemed to be a marker for humanity. Two other strengths had a numerically

TABLE 4 | Intercorrelation among the prototypicality ratings for the six virtues.

	Courage	Humanity	Justice	Temperance	Transcendence
Wisdom	0.24	0.23	0.32	0.28	0.27
Courage		0.20	0.34	0.13	0.20
Humanity			0.59	0.34	0.33
Justice				0.41	0.23
Temperance					0.19

N = 2664.

TABLE 5 | Mean prototypicality of each the 24 strengths for the six virtues (controlled for effects of gender, age, expert status) as well as the overall virtue prototypicality.

	Wisdom	Courage	Humanity	Justice	Temperance	Transcendence	Overall
Creativity	**4.27**	3.78	2.46	1.97	1.78	2.89	2.89
Curiosity	**4.82**	3.80	2.78	2.19	1.84	3.12	3.09
Open-mindedness	**5.44**	3.44	3.13	3.98	2.96	2.66	3.58
Love of learning	**5.31**	2.95	2.71	2.21	2.27	2.87	3.06
Perspective	**5.80**	2.75	3.73	3.85	3.41	3.56	3.83
Bravery	2.73	**5.92**	3.09	3.30	2.58	2.66	3.37
Persistence	3.57	**4.05**	2.56	2.94	3.77	2.40	3.27
Honesty	3.60	**4.26**	3.69	4.15	2.94	2.78	3.59
Zest	2.63	**4.32**	2.68	2.24	1.84	2.78	2.72
Love	2.79	3.06	**5.25**	3.13	3.00	3.49	3.48
Kindness	2.70	2.48	**5.40**	3.10	2.65	3.06	3.22
Social intelligence	4.28	2.72	**4.76**	3.96	3.21	2.51	3.57
Teamwork	3.14	2.62	*4.58*	**4.23**	3.45	2.75	3.51
Fairness	3.43	3.05	4.41	**5.86**	3.36	2.79	3.83
Leadership	*3.93*	*4.14*	3.54	**3.92**	2.92	2.24	3.48
Forgiveness	3.67	3.05	*5.47*	*4.02*	**3.71**	3.65	3.93
Modesty	3.28	2.14	3.70	2.91	**4.76**	3.29	3.36
Prudence	4.14	2.05	2.77	2.76	**4.63**	2.29	3.10
Self-regulation	3.33	2.78	2.69	2.78	**5.70**	2.60	3.32
Beauty	3.63	2.06	2.82	1.91	1.91	**4.26**	2.71
Gratitude	3.21	2.14	*4.57*	3.55	3.06	**3.72**	3.34
Hope	3.08	3.92	3.41	2.68	2.35	**4.10**	3.26
Humor	3.30	2.78	*3.96*	2.09	2.10	**2.47**	2.76
Spirituality	2.83	2.27	3.01	2.58	2.78	**5.72**	3.19

Beauty = Appreciation of beauty and excellence. Virtue assignment in Peterson and Seligman (2004) are shown in boldface; italics indicate strengths that are more prototypical for a virtue other than the assigned one.

higher prototypicality for a different virtue than its own, namely teamwork (for humanity in addition to justice) and gratitude (for humanity in addition to transcendence). For two strengths there were two additional virtues at least equally relevant: forgiveness was more prototypical for humanity and justice than it was for temperance, and leadership was more relevant for courage and for wisdom than it was for justice. It should be mentioned that four strengths (that marked the own virtue best) were also good markers (>4.0) for a further virtue: honesty for justice, social intelligence and prudence for wisdom, and fairness for humanity. Said in a different way, of the strengths that were a very good marker for their virtue only one was also a marker for a different virtue. Of the 11 strengths that were good markers for their virtue four also marked a second virtue. Finally, all three strengths that were quite good markers for their own virtue also were good or very good markers for one or

two other virtues. Thus, for seven strengths no "one to one"-correspondence to a virtue could be found but they proved to be more complex. The only strength that was wrongly assigned turned out not to be complex with only being prototypical for humanity.

As there also was a powerful main effect, the overall virtuousness rating will be considered, too (see last column in **Table 5**). It is evident from **Table 5** that the strengths with the lower scores had both a lower prototypicality rating for the assigned virtue and also fewer virtues they were prototypical for. These strengths (i.e., high curiosity, love of learning, creativity, humor, zest, appreciation of beauty and excellence) also did not feel very virtuous compared to the ones with a high total score (i.e., forgiveness, perspective, fairness, honesty, open-mindedness, and social intelligence), which all marked justice and tended to mark humanity and wisdom.

Does the Nature of the Experts Matter?

A $3 \times 6 \times 24$ ANCOVA with the expert type (psychologists, philosophers, theologians) as grouping factor, the six virtues and the 24 strengths on the repeated measure factors, and gender and age as covariates was computed for the prototypicality ratings. There was a strong effect of type of experts [$F(1,61) = 20,681$, $p < 0.001$, $\eta_p^2 = 0.404$], and the *post hoc* tests (Fishers PSL) showed that the theology group ($M = 4.06$) was higher ($p < 0.001$) than both the philosophers ($M = 2.91$) and psychologists ($M = 2.73$), which did not differ from each other ($p = 0.55$). Furthermore, type of expert was also involved in an interaction with virtue ($\eta_p^2 = 0.102$), strengths ($\eta_p^2 = 0.057$) and the virtue $\times$ strength interaction ($\eta_p^2 = 0.093$). Therefore, three separate 6×24 ANCOVAs were performed with the six virtues and the 24 strengths on the repeated measure factors, and gender and age as covariates were computed for the prototypicality ratings for the three groups. For the psychologists, the rating for wisdom was higher and the one for transcendence was lower than all others. Furthermore, humanity was rated higher than justice and temperance. For philosophers, both humanity and wisdom were higher than all others, transcendence was lower than justice, but not significantly lower than courage and temperance. For the theology group there were three clusters of virtues that differed from each other but not within: temperance was lower than all other virtues, humanity and wisdom were highest and courage, justice, and transcendence were in between (see **Figure 1**).

Furthermore, the interactions between virtues and strengths were all significant at $p < 0.001$ (η_p^2: psychologist = 0.132, philosophers = 0.129, and theologians = 0.075). Analyses like the one in **Table 5** were performed for the three groups separately (The table is available upon request). A count of proper and false assignments was undertaken. Overall, 96.7% of the strengths were assigned properly (see **Table 5**) and there were 24.0% of the cases where a strength exceeded 3.5 for a certain virtue. This analysis illuminated the rating behaviors of the three groups. The theologians did have a 100% hit rate for the assigned

virtues, but also had 76.6% "false" assignments. Psychologists (75.00%) and philosophers (83.33%) did not judge all strengths being prototypical for the assigned virtue, but they also did not make many "false" assignments (psychologists: 9.27% and philosophers: 13.02%). In other words, the theology group erred on the overinclusion side: they did not miss any strength linked to a virtue, but saw many strengths linked to many virtues. Most strikingly, they saw each strength exceeding the prototypicality cut-off point for both wisdom and humanity. The psychologists and philosophers only did catch two out of the five transcendence strengths and also missed one (or two) strengths of justice. They did agree on what is a second marker. Wisdom also covered social intelligence and prudence, humanity covers teamwork, forgiveness, and gratitude, and courage also covered leadership.

The Structure of Strengths as Reflected in the Virtue Prototypicality Ratings

Next, the 24 strengths were intercorrelated across raters and virtues ($111 \times 6 = 666$ data points) simultaneously and subjected to a principal component analysis. Five Eigenvalues were greater one and the scree test suggested the retention of 5 or 6 factors (Eigenvalues: 8.25, 2.90, 1.93, 1.80, 1.41, 0.82, 0.68, 0.65, and 0.51). Both solutions were inspected and the six-factor solution (which explained 71.3% of the variance) was found to be more meaningful. The Varimax-rotated factors are given in **Table 6**.

The factor of wisdom and knowledge explained 15.2% of the variance and not only encompasses creativity, curiosity, judgment, love of learning, and perspective, but also and to a lower extent appreciation of beauty and excellence, humor, and social intelligence. The latter three had double loadings and were also marking other factors. The factor of courage (12.5%) was clearly loaded by bravery and zest, and to a lower extent by endurance, and honesty, which also loaded on the factors of temperance and justice, respectively. Hope, leadership, and creativity also loaded on courage—all of them demonstrated double loadings. While the temperance strengths of modesty, prudence, and self-regulation were complemented by endurance, temperance (9.8%) was not loaded by forgiveness. Forgiveness (and partly also modesty), the strengths of humanity (love, kindness, and to a lower extent social intelligence), some strengths of justice (teamwork, fairness) marked the first and strongest (17.0% explained variance) factor together with gratitude and humor. Furthermore, a fifth factor resembles justice and was composed of fairness and leadership, but also judgment, perspective, honesty, and social intelligence. Finally, a factor of transcendence (8.1%) was clearly marked by spirituality and beauty/excellence and to a lower extent also by hope and gratitude. All except spirituality had double loadings. Humor was clearly not part of transcendence.

The labeling of the factors was underscored by the fact that the mean prototypicality ratings (see **Table 5**) and the factor loadings (**Table 6**) were very highly correlated. The more a strength was seen to represent a virtue, the higher was its loading on a factor labeled after this virtue. The coefficients were particularly high for humanity ($r = 0.95$), courage ($r = 0.91$), temperance ($r = 0.90$), and lower for justice and transcendence (both: $r = 0.95$), and
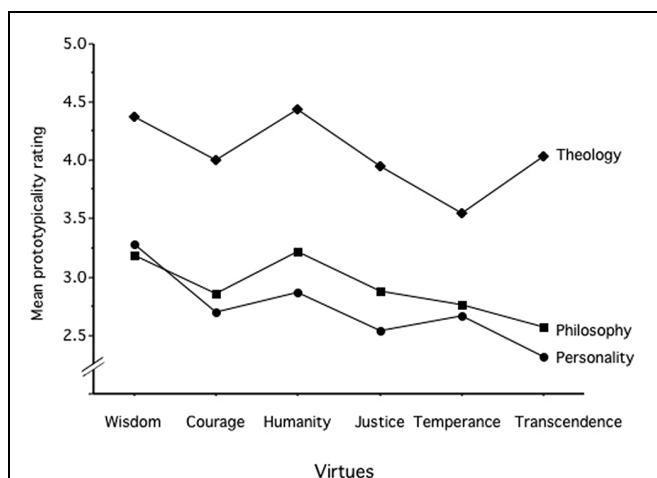

FIGURE 1 | Mean prototypicality rating for the 24 strengths in the six virtues for the groups of psychologists, philosophers, and theologians.

TABLE 6 | Varimax loadings of the 24 strengths of the six factors based on the analysis of the prototypicality ratings.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Creativity	0.04	**0.73**	**0.41**	−0.03	−0.11	0.11
Curiosity	0.09	**0.78**	0.35	0.02	0.02	0.14
Judgment	0.04	**0.63**	0.18	0.19	**0.51**	0.01
Love of learning	0.11	**0.84**	0.14	0.18	0.04	0.08
Perspective	0.13	**0.66**	−0.10	0.26	**0.40**	0.20
Bravery	0.05	0.11	**0.86**	0.02	0.15	0.00
Endurance	0.03	0.26	**0.54**	**0.56**	0.02	−0.14
Honesty	0.24	0.16	**0.54**	0.11	**0.50**	0.08
Zest	0.10	0.29	**0.77**	0.01	0.01	0.22
Love	**0.85**	0.10	0.14	0.04	−0.07	0.07
Friendliness	**0.83**	0.03	0.13	−0.01	0.16	0.20
Social intelligence	**0.54**	0.37	0.04	0.17	**0.50**	0.00
Teamwork	**0.65**	0.03	0.08	0.19	0.36	−0.11
Fairness	**0.40**	−0.06	0.14	0.10	**0.75**	0.03
Leadership	0.26	0.24	**0.47**	0.10	**0.44**	−0.25
Forgiveness	**0.79**	0.07	0.02	0.16	0.18	0.13
Modesty	**0.43**	0.03	0.02	**0.67**	0.11	0.29
Prudence	0.09	0.30	−0.11	**0.71**	0.25	0.06
Self-regulation	0.09	0.01	0.13	**0.88**	0.02	0.03
Beauty/excellence	0.17	**0.47**	0.07	0.01	−0.01	**0.69**
Gratitude	**0.64**	0.11	0.04	0.15	0.32	**0.40**
Hope	0.22	0.22	**0.59**	0.05	0.01	**0.48**
Humor	**0.54**	**0.46**	0.24	0.07	0.06	0.17
Spirituality	0.18	0.07	0.11	0.12	−0.01	**0.82**

Loadings ≥ 0.40 are shown in boldface.

somewhat lower for wisdom ($r = 0.79$; all $p < 0.001$). The coefficients between the non-homologous variables were between $r = -0.50$ and $r = 0.36$.

Discussion

The present rating study provides support for the internal structure of the VIA-classification of virtues and strengths but also allows suggesting some changes. Most importantly, the scales are indeed prototypical for the virtues with 10 exceeding 5.0 (i.e., being very good markers), nine strengths exceeding 4.0 (i.e., being good markers, and four exceeding 3.5 (i.e., being a marker) of the virtue it was originally assigned to. Only one strength was not considered prototypical: humor did fail to reach the cut-off value of 3.5 for transcendence. Thus, the major outcome of the study is that the assignment of the strengths to virtues as put forward by Peterson and Seligman (2004) was correct with one exception. For humor one might consider relocating this strength under humanity, but it also shows relations to wisdom (Beermann and Ruch, 2009a,b).

The second major outcome is that several strengths relate to more than one virtue and occasionally they were found more prototypical for a different virtue then for the one they were assigned to. In fact, the major difference between high and low virtue strengths is the number of strengths they are prototypical for (not only the degree of prototypicality). This has at least two

consequences. First, the fact that strengths may be prototypical for more than one virtue means that rotation to simple structure inevitably will not be successful, as simple structure expects variables to have a salient loading on only one factor, and zero loadings on the other factors. Second, this has implications for the theoretical model. Is a bi- or multimodal classification feasible? Is it compatible with Linnaean thinking? Can one say that the virtue of wisdom may not only be achieved through creativity, curiosity, or perspective but also through social intelligence and prudence? And the former also fosters humanity and the latter temperance? Shall the strengths that were more prototypical for a different virtue be rearranged in the classification and handbook (Peterson and Seligman, 2004); i.e., shall leadership be moved to courage, and teamwork, forgiveness, and gratitude be subsumed under humanity? There is some convergence across the prototypicality ratings and the results of the factor analysis and these converging deviations do provide a basis for starting to think about rearranging the entries of the classification. The present study only provides an initial step and more converging evidence needs to be accumulated.

So far, work on the structure of the strengths and virtues have been exclusively done in a factor-analytic framework. In such articles the authors typically insinuate that Peterson and Seligman (2004) had a hierarchical factor analytical model in mind just as it is omnipresent in personality research. Without giving any factual evidence (i.e., a direct quote from the book or articles) for this insinuation, authors typically proceed to say that they want

to test this assumption (attributed to Peterson and Seligman) empirically. Virtually everyone failed to confirm what would be a factor analyst's dream, namely, that the strengths intercorrelate in a way that there is a need to extract six factors, which can be identified as the postulated virtues and are loaded highly by the set of strengths assigned to that virtue (and only by those strengths). Based on both our theoretical reasoning and on the results of the present study we argue that running factor analyses on the instruments measuring the VIA classification is likely to face three challenges: first, studying the strengths-virtue relations by identifying the structure derived from the intercorrelation of the 24 strengths is bound to fail as the VIA-classification is not a factor-analytic model and virtues cannot be defined by the intercorrelation of strengths. Second imposing simple structure on the derived factor matrices is comparable to forcing the data into a Procrustean bed; i.e., fitting into an unnatural scheme or pattern. There is also a third problem that impairs finding a proper structure using factor analysis, namely, strengths of justice and strengths of humanity are more difficult to separate as the former are strengths *among*, and strengths of love are strengths *between* people, but the difference is assumed to be more of degree than of kind. Thus, it is unlikely to find the strengths loading on different factors. Perhaps the justice strengths jointly should fit under humanity; they should form one factor in a first step that then is—with the other strengths of humanity—a joint factor of humanity. Indeed, in the present study all strengths of justice were also covered by humanity but not vice versa, humanity strengths were not covered by justice; only social intelligence shows some fairly good prototypicality for justice. Here more theoretical work is needed that then can lead to empirical testing.

While we argue that factor analysis is not ideally suited to test the relation between strengths and virtues we do not imply that factor analyses of the strengths should not be conducted. It allows finding redundancy in the scales and it is also interesting to talk about the latent structure underlying the strengths—or the strengths as represented in measurement instruments. However, we do warn of two consequences: first, factors should not be expected to lead to the six virtues in the VIA classification. More importantly, we believe that it would be wrong to take such factors as the new reference and start deleting or adding strengths to fit these arbitrary factors.

The present study shows that humor might be the only clearly misclassified strength as there is no apparent link to transcendence. The pilot study showed that the five domains of descriptions converged very strongly for humor. Hence, this cannot be merely attributed to, for example, the items, which do not emphasize the transcendence aspect strongly enough. In fact, this was foreseen by Peterson and Seligman (2004) when stating: "In a few cases, the classification of a given strength under a core virtue can be debated. Playfulness, for example, might be considered a strength of humanity because humor and whimsy can create social bonds. It might also be classified as a wisdom strength, inasmuch as playfulness helps us acquire, perfect, and use knowledge. But we had a reason for dubbing playfulness a strength of transcendence: like hope and spirituality, playfulness connects us to something larger in the universe,

specifically the irony of the human condition, the incongruent congruencies to which playful people call our attention, for our education and amusement" (p. 26). The results of the present study suggest that humor (as defined in the VIA-classification) is linked to both humanity and wisdom (to a lower extent). This underscores the results of prior studies that suggest that while humor may be related to all virtues, the alignment is most strongly for humanity and wisdom (Beermann and Ruch, 2009a,b; Müller and Ruch, 2011). This is the last issue to be highlighted in improving the fit between strengths and virtues. One should consider for each strength whether it can serve only one or more virtues, and if yes whether this should enter their definition. For example, humor may reflect wisdom when the incongruities people encounter in life are highlighted and this then enables a person not to take things too seriously. Benevolent humor serves humanity when we use it to brighten someone's day or when making others laugh at our misfortunes. Humor in the form of understatement, especially as an alternative to being upset, and moderated statements that do not hurt anyone is in line with temperance. Satire and corrective humor may serve justice when we correct a bully or oppressor and protect a victim or target. Humor reflecting the insight that from a larger perspective our problems are minimal and as humans we are all bound to fail and we should be accepting this might relate to transcendence. So, at least for humor, the exact definition of the strength may be varied to match the fit to a virtue.

This study has several limitations. The selection of the experts and laypersons can be debated. We selected the experts based on their expertise, but cannot exclude that a different set of experts would have come to different conclusions. For example, the experts from theology where mostly chairs in catholic or protestant theology and maybe it would have been different if other religions had dominated. Also all experts were form the German speaking countries. Therefore, a cross-validation of the findings with a different set of raters form different parts of the world might be desirable. We had roughly the same amount of experts in personality, philosophy, and theology and hence the results are balanced across these disciplines. However, it became obvious that theologians were very different from psychologists and philosophers. They saw more of the strength related to virtues and did not discriminate that much among the virtues. This might be partly due their training and convictions but it might also be due to less familiarity with rating scales. Clearly, in particular the results for theologians await replication albeit the provided definitions of the virtues should minimize the subjectivity. We had the experts do one judgment and did not repeat it, so we do not know how stable these ratings are.

Another shortcoming might be the definition of the virtues. The core elements of the descriptions provided by Peterson and Seligman (2004) were used. Allowing for a more extensive study of the virtues might have been helpful, in particular to those that were not that familiar with virtues, or particular virtues, such as transcendence. Interestingly, also the laypersons did do comparably well and yielded results that were comparable to the experts, which means that the task was not that difficult. A replication

study might allow for more time to get familiar with the virtues and maybe this will enhance the validity.

Conclusions

The links between strengths and virtues as suggested by the present study are different from both the original classification (Peterson and Seligman, 2004) and the factor analytic studies (e.g., McGrath, 2014). The lesson to be learned is that the strengths may be in the service of several virtues simultaneously. This is not really in contradiction to the classification. If these double relations are a problem, then the concept needs to be purified and the contents that provide the link to the other virtues need to be stripped off. Furthermore, the results also demonstrate that studying the intercorrelation of the strengths is not the golden road to arrive at virtues. From the intercorrelation of strengths, a strength factor can be derived, but not necessarily a virtue. While individuals may act in accordance with a virtue to a certain extent (and thus produce individual differences in a virtue), the virtues are not defined by their mutual overlap among the strengths. The virtues exist independent of the different strengths that enable individuals to display that virtue. There is a body of research that defines virtue factors though intercorrelations of lexical virtue terms (e.g., De Raad and Van Oudenhoven, 2011). There are factors such as sociability, achievement, respectfulness, vigor, altruism, and prudence (De Raad and Van Oudenhoven, 2011) or self-confidence, reflection, serenity, rectitude, perseverance and effort, compassion, and sociability (Morales-Vives et al., 2014). Without going into detail, it can be seen that these virtues do not seem to be of a more narrow nature compared to "humanity" or "wisdom" and are more at the level of strengths. Likewise the shorter lists still are more narrow, representing empathy, order, resourcefulness, and serenity (Cawley et al., 2000). Therefore, it seems that the six core virtues of Dahlsgaard et al. (2005) are only partially directly represented in the virtue factors identified in the present study.

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Strengths-based positive psychology interventions: a randomized placebo-controlled online trial on long-term effects for a signature strengths- vs. a lesser strengths-intervention

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Recent years have seen an increasing interest in research in positive psychology interventions. There is broad evidence for their effectiveness in increasing well-being and ameliorating depression. Intentional activities that focus on those character strengths, which are most typical for a person (i.e., signature strengths, SS) and encourage their usage in a new way have been identified as highly effective. The current study aims at comparing an intervention aimed at using SS with one on using individual low scoring (or *lesser*) strengths in a randomized placebo-controlled trial. A total of 375 adults were randomly assigned to one of the two intervention conditions [i.e., using five signature vs. five lesser strengths (LS) in a new way] or a placebo control condition (i.e., early memories). We measured happiness and depressive symptoms at five time points (i.e., pre- and post-test, 1-, 3-, and 6-months follow-ups) and character strengths at pre-test. The main findings are that (1) there were increases in happiness for up to 3 months and decreases in depressive symptoms in the short term in both intervention conditions; (2) participants found working with strengths equally rewarding (enjoyment and benefit) in both conditions; (3) those participants that reported generally higher levels of strengths benefitted more from working on LS rather than SS and those with comparatively lower levels of strengths tended to benefit more from working on SS; and (4) deviations from an average profile derived from a large sample of German-speakers completing the Values-in-Action Inventory of Strengths were associated with greater benefit from the interventions in the SS-condition. We conclude that working on character strengths is effective for increasing happiness and discuss how these interventions could be tailored to the individual for promoting their effectiveness.

Keywords: character, character strength, depression, happiness, online intervention, positive psychology, positive psychology intervention, VIA

Introduction

One of the applied areas of positive psychology that has generated much interest over the past years is the field of positive psychology interventions (PPIs). The core characteristic of these types of intentional activities is that they are "[…] treatment methods or intentional activities that aim to cultivate positive feelings, behaviors, or cognitions" (Sin and Lyubomirsky, 2009, p. 468). Fordyce (1977, 1983) published two landmark studies on interventions for increasing happiness in students. He proposed 14 fundamentals (e.g., keep busy and be more active, spend more time socializing, develop positive, optimistic thinking, or become involved with meaningful work) that may be linked with happiness. With the emergence of positive psychology the interest in those types of activities has steadily increased and Sin and Lyubomirsky (2009) already list 51 intervention studies in their meta-analysis. Their research provides evidence for the effectiveness of PPIs and they identify specific conditions (e.g., individual vs. group vs. online training), which have an impact on the effectiveness of the interventions (see also Bolier et al., 2013). A recent study also supports the notion that the way people work with a PPI can predict a substantial portion of variance in life satisfaction (6%) and depression (10%) about 3.5 years after completion of the intervention (Proyer et al., 2015). Hence, there is broad evidence that encourages further research in this area.

The present study deals with one specific variant of PPIs, namely strengths-based interventions. Peterson and Seligman (2004) published a classification of 24 strengths and six universal virtues; the Values-in-Action (VIA)-classification. One of the criteria for the inclusion of a strength in the classification was that it should contribute to individual *fulfillment*. Broad evidence has been collected over the past years from correlational studies (using different methods for the assessment of strengths including peer-reports and a broad variety in the samples studied) that the VIA-strengths are positively associated with different indicators of subjective well-being (see Park et al., 2004; Park and Peterson, 2006a,b; Peterson et al., 2007; Ruch et al., 2007, 2010, 2014a,b; Khumalo et al., 2008; Brdar et al., 2011; Proyer et al., 2011, 2013a; Gander et al., 2012; Güsewell and Ruch, 2012; Littman-Ovadia and Lavy, 2012; Buschor et al., 2013; Martínez-Martí and Ruch, 2014; Azañedo et al., 2014; Berthold and Ruch, 2014). When Peterson and Seligman (2004) introduced the VIA-classification, they argued that strengths are malleable and, therefore, could be used for strengths-based interventions[1] targeting well-being. Later it has been argued (see e.g., Park et al., 2004) that primarily those strengths should be targeted in interventions that correlate most with life satisfaction. This received initial support from a study where interventions targeting those five strengths that are most correlated with life satisfaction in a 10-week program led to an increase in life satisfaction, while this

was not the case for a group that trained in five low-correlated strengths (in a program of equal length; Proyer et al., 2013b). It should be noted, however, that also those participants that were in the group that trained low-correlated strengths reported a subjective benefit from their participation in the program. Additionally, specific strengths seemed to play an important role—irrespective of whether they were directly targeted in the program or not. For example, those participants (in both groups), which reported an increase in self-regulation over the course of the program also reported greater benefit from the interventions (Proyer et al., 2013b).

When thinking about strengths-based interventions the idea of so-called *signature strengths* (SS) is important. Peterson and Seligman (2004) argue that each person possesses three to seven (out of the 24) character strengths, which characterize the person best. They set up several criteria for SS such as, that people experience a feeling of excitement while displaying the strength, or that the use of the strength is invigorating rather than exhausting. Seligman et al. (2005) report findings from a placebo-controlled self-administered online PPI study where one group of participants was assigned to a SS-intervention ("Using SS in a new way"). Participants were instructed to complete the Values-in-Action Inventory of Strengths (VIA-IS; Peterson et al., 2005), which is a subjective measure of the twenty-four VIA strengths. Upon completion participants were "[…] asked to use one of these top strengths in a new and different way every day for 1 week" (Seligman et al., 2005, p. 416). In comparison with a placebo control (PC) condition (writing about early memories), greater levels of happiness were found at 1 week, 1 month, 3 months, and 6 months after the completion of the intervention, and the same results were found for depression with additional effects immediately at the post-test measure. Seligman et al. (2005) also found that the *identification* of one's SS alone without further consideration had no effects on the dependent variables (happiness and depression).

In a first replication of the findings for the "Using SS in a new way"-intervention with an identical design, Mongrain and Anselmo-Matthews (2012) found comparable results for happiness (effective for up to 6 months), but did not find any effects on depressive symptoms. A further replication of Seligman et al. (2005) with data from German-speaking participants with some adaptations (i.e., advertising the study as a "train your strengths"- rather than an "increase your happiness"-intervention), but with an identical design found similar effects for happiness (effects for 1, 3, and 6 months) and depression (post-test, 1 month, and 6 months and with lower effect sizes for the 3 months time point; Gander et al., 2013). However, in a recent study, which only included 50–70 year old German-speaking participants and the same instructions and design as in the Gander et al. (2013) study, there were effects for happiness (at all post measures), but for depressive symptoms only for the post-test and the 1 month measure (Proyer et al., 2014). Other studies have found effects for SS-interventions for personal well-being as well as an engaged and pleasurable life (Mitchell et al., 2009), and life satisfaction (Duan et al., 2013; see also Bridges et al., 2012). Furthermore, harmonious passion seems to be a moderator of the effectiveness of the intervention on well-being (Forest et al., 2012), whereas

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[1]It needs mentioning that we use the term of strengths and strength-based interventions in line with Peterson and Seligman's (2004) notion of *character* strengths, i.e., morally positively valued traits. This differs from other usages of the word (personal) *strengths* such as, for example, Wood et al. (2011, p. 16), who see strengths as "[…] characteristics that allow a person to perform well or at their personal best […]" and make no references to the moral aspect of *character* strengths.

extraversion was identified as a moderator of the interventions' effects on depressive symptoms (Senf and Liau, 2013). It has also been argued that the identification and cultivation of SS should be a core part of interventions in the field of positive psychotherapy (Seligman et al., 2006) and their usage in clinical training has also been advocated (Fialkov and Haddad, 2012). Overall, there is strong evidence that interventions targeting SS are effective in increasing various indicators of subjective well-being. Findings for depression are mixed, but they point toward a potential contribution for ameliorating levels of depressive symptoms as well.

When conducting the "Using SS in a new way"-intervention, participants complete the VIA-IS and strengths are then rank-ordered according to their means. Participants get feedback on their highest five strengths (based on the mean scores) as the signature or top strengths (Seligman et al., 2005). While these strengths fulfill certain characteristics (Peterson and Seligman, 2004), the question arises on whether strengths that are rank ordered on the bottom according to their means also may be useful in strength-based interventions. At this point it is important to note that the VIA-IS does not measure *weaknesses*, but that those strengths only have comparatively lower expressions, which means that participants indicate that they possess the strength to a relatively lower degree. Hence, one might speak of a person's *lesser* strengths (LS). As mentioned, however, this should *not* be interpreted as the absence and, of course, also *not* as the opposite of a given strength (see Seligman, 2015).

Research has shown that it is fruitful to work on ones SS, but the question arises whether it may also be effective to work on ones LS. There are two studies, which provide first hints on the potential effectiveness of such an approach. Rust et al. (2009) published a preliminary study involving 76 College students who completed the VIA-IS and were randomly assigned to a group that worked on two of their SS (based on the VIA-IS results, selected out of the five SS), or another group who worked on one strength that was a "relative weakness," and one SS (in addition, a 32-student no-treatment group was tested) for 12 weeks. The dependent variable was life satisfaction assessed via Diener et al.'s (1985) satisfaction with Life-scale. Rust et al. (2009) did not report differences in the gain of life satisfaction between the two intervention groups. If the two intervention groups were pooled they showed larger gains in life satisfaction than the no-treatment group. The authors acknowledge that this is a preliminary study and, of course, it does not provide strong evidence for or against working with the LS – it only seems as if there were no detrimental effects if one of the LS was involved in the intervention.

In a second study, Haidt (2002) published a report on a comparison of students that completed a "strengths-first" program (working on strengths for two weeks based on the VIA-IS) and a "weakness-first" group (working on low scoring, strengths). Students received a list with 120 suggested activities (three to eight for each strength) and were allowed to select what they wanted to do. After the two weeks, the students switched their group assignment and worked on their strengths or relative weaknesses for another two weeks. A broad range of variables (ten dependent variables) were assessed at pre-test, after two weeks

(before switching groups), and after another two weeks. After the first two measurement time points the students in the "strengths-first" program reported greater enjoyment of the activities than the "weakness-first" group. Other effects (e.g., subjective well-being, self-esteem, rating of one's overall health) were weak or mixed and Haidt (2002) concludes that the notion that it may be better to work on a strength than on a weakness (see Buckingham and Clifton, 2001) was not supported. Of course, both of these studies are preliminary in their nature and do not address a comparison directly, but support the notion that it is fruitful to test the differences between interventions targeting *SS* and *LS* (strengths with comparatively low expressions) in more detail. Based on the reported findings, the question emerges whether being instructed that the selected strengths are the personal SS has an effect in itself. To the best of our knowledge it has not been tested thus far whether interventions where participants are assigned to work with selected strengths (varying whether they work with SS or LS without informing them on whether the selected strengths are their signature or their LS) demonstrate similar effects to those reported for the "Using SS in a new way"-intervention.

The Present Study

In the present study, we examine whether working on character strengths is beneficial, regardless of the individual rank order of these strengths: i.e., independently of working on one's *signature* or on one's *LS*. Participants completing the original "Using your SS in a new way"-intervention (as used by Seligman et al., 2005) were explicitly informed that the assigned strengths are their SS. Using this instruction would not allow for a direct comparison with another group of participants working on their LS, since writing a strictly parallel instruction would be difficult in the sense of potentially demotivating participants from engaging in the intervention. Therefore, we decided to adapt the original instruction for our study in order to provide participants in two experimental conditions (SS vs. LS) with identical instructions (see "Procedure" for the detailed instruction). In short, we assigned our participants randomly to three conditions; (1) the *SS* condition, and (2) the *LS* condition, instructing both groups to work on five selected strengths without indicating that these are their SS or LS, or (3) a *PC* condition.

This study has four main aims. The first main aim is (1) testing whether both types of interventions (SS vs. LS) are effective in increasing happiness and ameliorating depression in comparison with a PC ("early memories"; Seligman et al., 2005). The second main aim is (2) investigating whether working on the SS is more effective than working on the LS even if participants are not explicitly informed that these are their SS. It was expected that both interventions would be effective in increasing happiness. Expectations for depression are in the same line, but not as strong (given mixed findings in earlier studies). Participants in our study completed the Authentic Happiness Index (AHI; Seligman et al., 2005) and the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) as measures for happiness and depression, but they also completed single item ratings for their satisfaction with (a) life in general; (b) work; (c) leisure time; (d) social life; and (e) health, since most of the literature generated on

character strengths is concerned with happiness or other indicators of subjective well-being on a general level, whereas the well-being or satisfaction with different life domains (SLD) is less frequently studied. In addition, as environmental conditions are rarely included, we were interested in testing whether such environmental issues play a role as well. Therefore, the participants also provided ratings on how they see the environmental conditions in each of these categories, irrespective of how satisfied they feel with them. We do not argue that these ratings are *objective* markers as they are based on subjective ratings. These ratings, however, may help in narrowing the gap in the literature on the potential role of circumstantial factors in PPIs. We will analyze perceived changes in happiness in these five different categories and in the analogous environmental factors. Additionally, the data allows the analysis of a "fit"-index between the ratings for satisfaction and environmental conditions. Given the lack of prior knowledge this is more of an exploratory approach, but we expect that there will be different effects for the five categories covered in this study.

The third main aim is (3) testing whether there is a difference in the enjoyment and in the subjective benefit of the different interventions. Based on previous findings (Haidt, 2002) we expected that participants in the SS condition would report higher levels of enjoyment and subjective benefit than those in the other conditions.

Finally, the fourth main aim is (4) testing a set of moderators that may play a role for the effectiveness of the respective intervention. Since all participants complete the VIA-IS it will be tested whether those participants that ascribe themselves more strengths in general, differ from those that ascribe themselves fewer strengths. This will be operationalized by using a total score out of the VIA-IS (the first unrotated principal component) as an indicator of self-ascribed strengths possession or global "virtuousness." It must be highlighted that this procedure contradicts one of the basic tenets of the VIA-classification, namely the plural nature of the good character. However, other examples have shown that using such a total score can be useful for *research* purposes. For example, Proyer and Ruch (2009) tested the localization of the fear of being laughed at (gelotophobia) in the VIA-classification. While the analysis of the bivariate correlations between each of the twenty-four strengths and the fear of being laughed at provided detailed information on the pattern of relations, the analysis of the total score allowed for a more straightforward interpretation of the data and showed a clearer picture of an underestimation of virtuousness in gelotophobes. Similarly, we argue that the analysis of one total score for the VIA-IS in this particular case will help for a better understanding of who benefits most from the respective interventions. As one aspect of this research aim, we will assess (4a) whether people who ascribe themselves many character strengths benefit more from the interventions (and vice versa). Overall, one might argue that those who ascribe themselves lower levels of virtuousness might benefit more from working on their SS in order to have some pronounced, high-level strengths, whereas those who ascribe themselves higher virtuousness might benefit more from working on their LS, since they already have some pronounced strengths and there is more

"room for improvement" in the LS. However, since there are no other studies available for a comparison, this analysis is of an exploratory nature.

These analyses will be followed-up by further investigations based on the character strengths: We will (4b) test whether higher scores in a single strength are predictive for the effectiveness of the intervention in each of the two conditions. Some authors have also reported higher order strengths-factors for the VIA-IS, i.e., a five-factorial solution (i.e., emotional, interpersonal, intellectual, theological strengths, and strengths of restraint) and a two-factorial solution based on ipsative scores (i.e., strengths of the heart vs. mind, and self- vs. other-directed strengths; see Peterson and Seligman, 2004; Peterson, 2006; Ruch et al., 2010; see also Ruch and Proyer, 2015), we will separately test whether higher expressions in these factors are related to the effectiveness of the intervention. Furthermore, we will also address the questions whether (4c) it is important which strengths are among the signature- or lesser-five strengths of an individual; whether (4d) the number of strengths belonging to a strengths-factor among the signature- or lesser five strengths of an individual are predictive for the effectiveness of the intervention; and (4e) whether the (dis-)similarity of the profile with an average profile in the German VIA-IS is predictive for success in each of the two conditions. Since comparatively few data exist on these potentially moderating variables, the analyses are of rather exploratory nature. The main aim of these analyses is testing the impact of individual expressions in strengths and their composition in more detail than what has been reported earlier. The analysis testing the (dis-)similarity with an average VIA-IS profile, which was derived from a large data set of German-speaking adults ($N = 1,674$) that have completed the VIA-IS (Ruch et al., 2010), will provide information on whether deviations from an average VIA-IS profile in any direction is predictive of success in the respective intervention.

Materials and Methods

Participants

A total of 1,046 participants registered on a research website offering a free of charge PPI program. Of these, 720 participants were eligible for participation and were randomly assigned to one of three conditions. Only participants who completed all follow-ups were analyzed (see **Figure 1**). The final sample consisted of $N = 375$ German-speaking adults aged 18 to 77 ($M = 46.40$; SD = 12.31).

Most participants were women (83.7%) of predominantly German (66.7%), Austrian (16.0%), or Swiss (14.9%) nationality. The sample was well educated: more than half (60.5%) held a degree from a university or a university of applied sciences, 20% held a diploma allowing them to attend a university or a university of applied sciences, 16% completed vocational training, and 3.5% completed secondary education. Almost half of the sample was married or in a registered partnership (48.3%), 22.1% were in a partnership (but not married or registered), 16.0% were single, 10.9% were divorced or living in separation, and 2.7% were widowed.
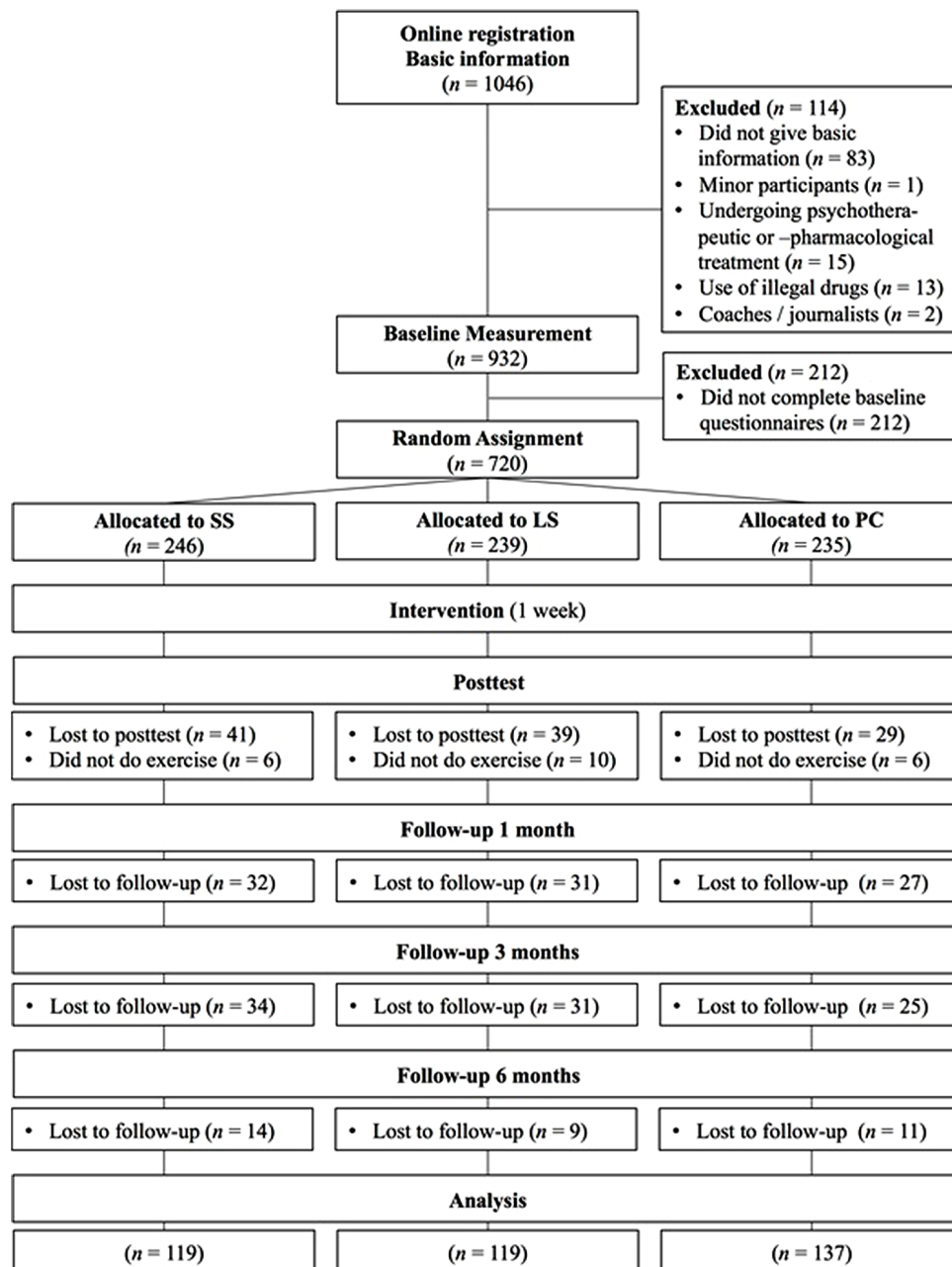
FIGURE 1 | Flow of participants. SS, signature strengths-intervention; LS, bottom strengths-intervention; PC, placebo control condition.

Participants in the three conditions did not differ in their age [$F(2,372) = 2.55$, $p = 0.08$], gender ratio [$\chi(1, N = 375) = 0.78$, $p = 0.68$], educational level [$\chi(6, N = 375) = 9.69$, $p = 0.13$], or marital status, $\chi(8, N = 375) = 11.80$, $p = 0.15$. There were no differences in happiness [$F(2,372) = 0.60$, $p = 0.55$] or depressive symptoms [$F(2,372) = 0.51$, $p = 0.60$] at pre-test.

When analyzing those participants who either did not complete the intervention or did not complete all follow-ups, it was revealed that the latter were on average about 2.6 years older [$t(718) = 3.00$, $p < 0.01$], than those that completed all assignments. They did not differ in terms of the gender ratio [$\chi(1, N = 720) = 1.01$, $p = 0.31$], their education [$\chi(4, N = 720) = 1.63$, $p = 0.88$], or marital status, $\chi(4, N = 720) = 5.18$, $p = 0.27$. Those dropping out were less happy [$t(718) = 2.92$, $p < 0.01$, $d = 0.15$] and reported more depressive symptoms [$t(718) = -1.98$, $p = 0.05$, $d = 0.22$] than those who completed all assignments. Finally, the number of dropouts did not differ across the three groups, $F(2,717) = 2.76$, $p = 0.06$; yet there was a tendency that participants in both strengths conditions dropped out more frequently than in the PC.

Instruments

The AHI (Seligman et al., 2005; in a German version as used by Ruch et al., 2010) is a subjective measure for the assessment of happiness. It consists of 24 sets of five statements [e.g., ranging from 1 ("I feel like a failure") to 5 ("I feel I am extraordinarily successful")] from which one has to choose the statement that describes one's feelings in the past week best. The AHI was especially designed for monitoring upward changes in happiness (Seligman et al., 2005) and has been often used in PPI studies (e.g., Ruch et al., 2010; Schiffrin and Nelson, 2010; Mongrain and Anselmo-Matthews, 2012; Proyer et al., 2014). In the present study, internal consistency at pretest was high ($\alpha = 0.94$).

The CES-D (Radloff, 1977; in the German adaptation by Hautzinger and Bailer, 1993) is a 20-item measure for the assessment of the frequency of depressive symptoms in the past week. It uses a 4-point Likert-style scale that ranges from 0 ["Rarely or None of the Time (Less than 1 day)"] to 3 ["Most or all of the time (5–7 days)"]. A sample item is "I felt depressed." The CES-D has very good psychometric properties and is one of the most frequently used depression measures (Shafer, 2006). In the present study, internal consistency at pretest was high ($\alpha = 0.90$).

The SLD and conditions in different life domains (CLD) rating forms were developed for this study. They assess the participants' satisfaction (SLD) and the subjectively estimated quality of the environmental conditions (CLD) in five different life domains; i.e., (a) life in general; (b) work; (c) leisure; (d) social life; and (e) health, with one item each. The scales use a 7-point Likert-style scale ranging from 1 (SLD: very dissatisfied; CLD: very bad) to 7 (SLD: very satisfied; CLD: very good). The ratings were rather stable over the six-month period and ranged in the SLD from $r_{tt} = 0.50$ (social) to 0.61 (work), and in the CLD from $r_{tt} = 0.49$ (work) to 0.58 (health and leisure).

The *Values in Action Inventory of Strengths* (VIA-IS; Peterson et al., 2005; German adaptation by Ruch et al., 2010) is a 240-item measure for the assessment of the 24 character strengths (10 items per strengths) covered by the VIA classification (Peterson and Seligman, 2004). It uses a 5-point Likert-style scale ranging from 1 (very much unlike me) to 5 (very much like me). A sample item is "I find the world a very interesting place" (curiosity). Several studies demonstrated the good psychometric properties of the German version of the VIA-IS (e.g., Proyer and Ruch, 2009; Müller and Ruch, 2011; Güsewell and Ruch, 2012; Buschor et al., 2013; Proyer et al., 2013a; Martínez-Martí and Ruch, 2014). Internal consistencies in the present study ranged from $\alpha = 0.71$ to 0.92 (median $= 0.80$).

Besides the scores for the 24 character strengths from the VIA-classification, Peterson and Seligman (2004) identified five higher order factors based on the raw scores (i.e., emotional-, interpersonal-, intellectual-, theological-strengths, and strengths of restraint), whereas Peterson (2006) also reported two higher order factors based on ipsative scores (i.e., strengths of the mind vs. heart, and self- vs. other-directed strengths). Both solutions have also been replicated for the German version of the VIA-IS (Ruch et al., 2010). In the present study, we report analyses for the 24 character strengths, and factor scores for the five- and

two-factorial solution of the VIA-IS. Additionally, we also computed a total score of the VIA-IS based on the first unrotated factor of the VIA-IS (see Proyer and Ruch, 2009).

Finally, we also assessed (using single item ratings) how much the participants liked the intervention [from 1 (*not at all*) to 7 (*very much*)], and collected a subjective rating on whether they noticed a personal benefit from the intervention and if so, how they quantify the benefit [from 1 (*no, not at all*) to 5 (*yes, very high*)].

Procedure

The study was advertised using online resources (i.e., mailing lists) and media reports. Exclusion criteria were younger age than 18, currently undergoing psychotherapeutic or psychopharmacological treatment, consummation of illegal drugs, and having a professional interest in participation (i.e., being a coach or journalist). The study was conducted online, on a website affiliated with an institute of higher education in the German-speaking part of Switzerland. After registration, participants completed demographic questionnaires, the VIA-IS (see **Figure 1**), the baseline measures of the dependent variables (AHI, CES-D, SLD, CLD), and were randomly assigned to one of three conditions: The SS (or top-) condition, the LS condition, or the PC condition. Participants in both strengths conditions (SS and LS) received feedback on their individual signature or lesser five strengths.[2] Further information was provided on strengths in general, with the following training instructions given to the participants in the SS and LS conditions:

> "We have selected five character strengths for you. Use one of these strengths in a new and different way every day for 1 week. You can apply the strength in a new environment or when interacting with a 'new' person. It is up to you how you want to apply these strengths. Try to apply these strengths, regardless of whether you feel like already using this strength frequently or not."

Additionally, we added a sentence saying that if participants were unsure on how to implement their strengths on a daily basis, we have provided a list with suggestions in the materials. The list was compiled from Haidt (2002) and Peterson (2006), and other strength-based programs (e.g., Proyer et al., 2013b). Thus, participants in both strengths conditions received identical instructions and differed only in the type of strengths assigned to them (SS or LS). Participants in the PC condition received the "early memories"-exercise (Seligman et al., 2005) and were required to write about an early childhood memory each day for a week. After the intervention week, as well as after 1-, 3-, and 6-months, participants completed measures of the dependent variables. Before each follow-up, participants received reminder emails. Additionally, participants were asked at post-test whether they had completed the assigned intervention. Participants who did not indicate that they had completed the intervention, or failed to complete all follow-ups were excluded from all further analyses. After completion of all assignments, participants received automatically generated, individualized feedback on their character

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[2]Religiousness was excluded (in both conditions) since we wanted to avoid instructing non-religious individuals to work on their religiousness.

strengths and their level of happiness and depressive symptoms over the course of the full 6 months.

Data Analysis

We analyzed the effectiveness of the intervention by means of repeated measurement ANCOVAs (repeated measurements = post-test, and follow-ups after 1-, 3-, and 6-months; independent variable = condition; covariate = pre-test score in the dependent variables). Each intervention (SS and LS) was separately compared with the PC condition, and only the main effects for "condition" are reported for an overall assessment of the effectiveness. These analyses were followed by separate ANCOVAs for each measurement time point as a dependent variable (independent variable = condition; covariate = pre-test score). Finally, the two intervention conditions were directly compared with each other, using the same analysis. For facilitating interpretation, the conditions were recoded (0 = PC; 1 = SS and LS), and t-scores are reported: Thus, positive t-scores indicate that the intervention condition outperformed the PC condition after controlling for the pre-test scores.

For the moderation analyses, we computed the same repeated measurement ANCOVAs for the overall effects as above, with the moderator as an additional continuous independent variable. We report only the interaction between the moderator variable and the condition (but not the main effects for the condition, or the moderator). In a second step, we conducted repeated measurement ANCOVAs for each condition separately to analyze how the moderator affects the outcomes. Again, positive t-scores indicate that higher scores in the moderator variables went along with higher expressions in the dependent variables after controlling for the pre-test scores.

Results

Intervention Effectiveness: Happiness and Depression

For a first inspection of the trends in the three conditions, mean scores, and SDs for all measurement time points are given in **Table 1**.

The table shows that happiness increased and depression decreased visually in all conditions, whereas the changes were numerically larger in the intervention conditions than in the PC condition. The results of the repeated measurement ANCOVAs, comparing each intervention separately with the PC condition while controlling for the pre-test scores are given in **Table 2**.

The table shows that there was an overall effect in happiness, but none in depression for both strength conditions. There was an increase in happiness in both conditions at the post-measure as well as at the 3-months time span (marginally significant for

TABLE 1 | Mean and SD of the three conditions at the five time periods for happiness and depressive symptoms.

		Pre		Post		1 M		3 M		6 M	
	N	M	SD	M	SD	M	SD	M	SD	M	SD
Happiness											
SS	119	3.01	0.50	3.10	0.52	3.16	0.53	3.13	0.56	3.13	0.58
LS	119	3.05	0.58	3.15	0.56	3.15	0.64	3.21	0.66	3.17	0.67
PC	137	3.09	0.55	3.09	0.57	3.13	0.61	3.11	0.57	3.16	0.58
Depressive symptoms											
SS	119	0.69	0.46	0.56	0.37	0.61	0.45	0.64	0.44	0.62	0.46
LS	119	0.63	0.46	0.53	0.38	0.59	0.47	0.55	0.45	0.62	0.52
PC	137	0.66	0.45	0.62	0.39	0.62	0.43	0.61	0.43	0.60	0.43

1 M, one month after the intervention; 3 M, three months after the intervention; 6 M, six months after the intervention; SS, signature strengths-intervention; LS, lesser strengths-intervention; PC, placebo control condition.

TABLE 2 | Overall effects for conditions (intervention condition vs. placebo control condition) and separate analyses for the time periods after the intervention for happiness and depressive symptoms (controlled for pre-test scores in the dependent variables).

	Overall		Post		1 month		3 months		6 months	
	t	η^2	t	η^2	t	η^2	t	η^2	t	η^2
Happiness										
SS	1.94*	0.02	2.06*	0.02	2.06*	0.02	1.60[†]	0.01	0.67	–
LS	2.04*	0.01	2.71**	0.03	1.14	–	2.33*	0.02	0.69	–
Depressive symptoms										
SS	0.63	–	−2.07*	0.02	−0.46	–	0.19	–	0.14	–
LS	0.82	–	−2.16*	0.02	−0.23	–	−1.13	–	0.63	–

All dfs = 253. η^2, eta squared; SS, signature strengths-intervention; LS, lesser strengths-intervention.
[†]$p < 0.10$; *$p < 0.05$; **$p < 0.01$ (one-tailed).

the SS condition). The group working with SS also increased in happiness at the 1-month time span. Effects for depression were only found at the post measure, but not at the other follow-ups. A direct comparison of the intervention conditions revealed no differences, neither for the overall effect [happiness: $t(235) = 0.16$, $p = 0.87$; depressive symptoms: $t(235) = -0.18$, $p = 0.86$] nor for the single time points (not shown in detail). Overall, findings were in the expected range and it was shown that both types of interventions had an effect on happiness.

Intervention Effectiveness: Satisfaction and Conditions in Different Life Domains

We computed the same analyses as reported in the previous section for the single item measures for SLD and the subjective rating of the environmental CLD. Additionally, we tested the "fit" between the two by computing the absolute differences between the standardized variables. Results for SLD, CLD, and their fit are given in **Table 3** (only overall effects for all time points after the interventions jointly are given).

The table shows that participants in both interventions reported more satisfaction with their health compared to the PC condition. Participants in the SS-intervention also demonstrated effects in the expected direction for the general life satisfaction and showed a trend toward an increase in the satisfaction with work. Regarding the subjective ratings of the environmental conditions, participants in both interventions rated their living conditions in general higher than before, and there was a trend toward rating the work conditions better than before. An inspection of the means (not shown in detail) revealed that the perceived quality of the living conditions was generally rated higher than the satisfaction with them. Scores in satisfaction with life in general increased in both conditions after completion of the

intervention, whereas the perceived quality of the living conditions remained more or less stable. In the PC condition, however, satisfaction ratings remained more or less stable, while the quality of the living conditions declined. In the SS condition there also was a trend toward rating the leisure conditions better than before. In both interventions, the "fit" between the ratings of the conditions of life in general and the satisfaction with these conditions *increased* (i.e., the absolute differences between the two decreased) due to the intervention. In the SS condition, the fit also increased for the leisure and social domains, and tended to increase in the work domain.

Enjoyment and Subjective Benefit of the Interventions

For assessing whether the conditions differed with regard to how much the participants enjoyed (i.e., liked) and perceived a subjective benefit from the interventions, we computed ANOVAs for both variables with the conditions as independent variables. Results revealed that the conditions did not differ in their enjoyment [$F(2,272) = 0.34$, $p = 0.71$] or their subjective benefit, $F(2,272) = 1.55$, $p = 0.21$. However, when comparing both intervention conditions together with the PC condition, a larger subjective benefit was reported for the intervention conditions than for the PC condition, $t(254) = 1.72$, $p = 0.04$, $d = 0.22$.

Moderating Effects of Character Strengths

In a first step, we were interested in whether the effectiveness of the intervention differed between participants who ascribe themselves generally more (or higher levels of) character strengths and those who ascribe themselves fewer (or lower levels of) strengths. For this purpose, we computed the same repeated measurement ANCOVAs as above, with a total score of character strengths ("virtuousness") as an additional independent variable. The total score was computed by extracting the first unrotated factor of a principal components analysis.

Table 4 shows that for those participants in the LS condition, higher scores in virtuousness went along with a stronger reduction of depressive symptoms, when compared with the

TABLE 3 | Effects for condition (intervention condition vs. placebo control condition) on satisfaction with different life domains (SLD), conditions in different life domains (CLD), and their fit (overall time periods after the intervention) controlled for pre-test scores.

	SLD		CLD		Fit	
	t	η^2	t	η^2	t	η^2
Signature strengths						
General	1.85*	0.01	1.91*	0.02	−1.70*	0.01
Work	1.48†	0.01	1.29†	0.01	−1.52†	0.01
Leisure	1.05	–	1.47†	0.01	−1.84*	0.01
Social	0.04	–	−0.12	–	−1.80*	0.01
Health	1.85*	0.01	0.92	–	−0.87	–
Lesser Strengths						
General	1.11	–	2.15*	0.02	−2.89**	0.03
Work	0.38	–	1.33†	0.01	−1.18	–
Leisure	0.52	–	0.60	–	−0.87	–
Social	−0.74	–	−0.13	–	−0.64	–
Health	2.01*	0.02	1.00	–	−0.98	–

All values are t-scores. All dfs = 1, 248. SLD, satisfaction with different life domains; CLD, conditions in different life domains; Fit, absolute differences of the standardized SLD and CLD; η^2, eta squared.
†$p < 0.10$; *$p < 0.05$; **$p < 0.01$ (one-tailed).

TABLE 4 | Moderating effects of virtuousness at baseline on happiness and depressive symptoms.

	PC comparison		Separate analyses		
	SS vs. PC	LS vs. PC	SS	LS	PC
df	251	251	116	116	134
Happiness	−0.44	1.19	1.07	3.16**	1.57
Depression	0.52	−1.97*	−0.73	−3.98***	−1.76

All values are t-scores. PC comparison = virtuousness × condition (0 = placebo control condition, 1 = signature/lesser strengths-intervention) as predictor of the happiness/depression scores after the intervention (all follow-ups averaged), when controlling for pretest scores in happiness/depression and virtuousness; separate analyses = prediction of happiness/depression scores after the intervention (all follow-ups averaged) by virtuousness when controlling for pretest scores in happiness/depression, for each condition separately; SS, signature strengths-intervention; LS, lesser strengths-intervention; PC, placebo control condition.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ (two-tailed).

PC condition. This effect was also present when comparing the LS directly with the SS, $t(233) = -2.29$, $p = 0.02$ (not shown in the table). When analyzing the conditions separately, higher scores in virtuousness were also associated with an increase in happiness for those in the LS condition. When computing a median-split for virtuousness and comparing the effects on happiness between the strengths conditions (SS vs. LS), a significant condition × virtuousness-interaction was found, $t(233) = 2.52$, $p = 0.01$. Simple main effects indicated that for the highly virtuous, the LS condition was more effective [$t(233) = 1.67$, $p = 0.05$; one-tailed], whereas for those low in virtuousness, the SS condition was more effective, $t(233) = 3.60$, $p = 0.03$ (one-tailed test).

In a next step, we were interested whether single character strengths, and higher order strengths factors moderate the effectiveness of the intervention. For obtaining the 5-factorial solution (as reported by Peterson and Seligman, 2004 and Ruch et al., 2010) we computed a principal component analysis on the raw scores, extracting five factors (the first seven Eigenvalues were 8.55, 2.54, 1.83, 1.38, 1.10, 1.00, and 0.97, respectively), and rotating them to the VARIMAX-criterion. The factorial solution was similar to the one reported in Ruch et al. (2010; Tucker's Φ was > 0.90 in all cases with the exception for strengths of restraint: Φ = 0.89). For obtaining the 2-factorial solution (as reported by Peterson, 2006 and Ruch et al., 2010), we computed a PCA on ipsative scores (standardized within the participants), extracted two factors (the first four Eigenvalues were 2.92, 2.56, 1.88, and 1.69) and rotated them to the OBLIMIN criterion (delta = 0). The moderating effects of single character strengths, and the higher order strengths factors were tested in repeated measurement ANCOVAs.

Table 5 shows that participants in the SS condition reported stronger increases in happiness for those that scored higher in love of learning, persistence, and teamwork. Those with higher love of learning reported stronger decreases in depressive symptoms. However, none of these effects reached significance in comparison with the PC condition. Participants in the LS condition reported stronger increases in happiness when they had higher baseline scores in nine out of the 24 strengths, and the higher order strengths factor of interpersonal strengths. For persistence and forgiveness, the moderating effects in the LS exceeded those in the PC. Also, participants in the LS condition reported a decrease in depressive symptoms for those higher in 13 out of the 24 strengths and the strengths factors of emotional and interpersonal strengths. For perspective, persistence, love, kindness, and social intelligence, the effects exceeded those of the PC condition. Finally, those participants in the PC condition who scored higher in curiosity, reported stronger increases in happiness; whereas higher scores in curiosity, zest, self-regulation, hope, and the emotional strengths-factor went along with a stronger reduction in depressive symptoms.

We also assessed whether the effectiveness of an intervention depends on *which* character strengths are part of either the signature or the lesser five strengths that people trained (not shown in detail). For this purpose, we compared the effectiveness of the intervention between those participants who had one particular character strength among their SS or LS with those who did not.

Results showed that those participants in the strengths condition showed stronger increases in happiness if they had teamwork among their SS, relatively weaker increases if open-mindedness was one of the SS, and stronger reductions in depressive symptoms if love of learning was one of the SS. Those in the LS condition showed weaker increases in happiness when self-regulation was one of the LS. However, it has to be noted, that some strengths were rarely among the SS or LS (groups sizes for the SS ranged from $n = 6$ (zest and self-regulation)] to $n = 69$ (curiosity); for the LS they ranged from $n = 4$ (fairness) to $n = 61$ (modesty)), and the group sizes were, therefore, rather small for some of the comparisons and need to be interpreted conservatively.

Data were not only analyzed at the level of the single strengths, but also for the broader strengths factors. We tested whether there is a difference in the intervention effectiveness for those participants who had more strengths of a specific factor among their SS or LS (not shown in detail). Results showed that in the SS condition, participants reported higher increases in happiness, the fewer strengths of restraint were among their SS. In the LS condition, increases in happiness were stronger for those with more interpersonal strengths among their SS, whereas stronger increases in happiness and amelioration of depressive symptoms were found for those with fewer strengths of restraint among their SS. The effectiveness of the intervention was independent of the number of strengths of a specific factor among the LS.

In a next step, we tested whether intervention effectiveness was also affected by an individual's profile in the character strengths. More precisely, we examined whether the deviation of an individual's profile from a profile generated from a large sample of German-speakers that completed the VIA-IS (Ruch et al., 2010) has a moderating effect on happiness and depressive symptoms. For this purpose, we computed the Euclidian distance (i.e., the square root of the sum of the squared differences) between an individual's profile and Ruch et al.'s (2010) sample. Again, we tested for moderating effects by means of repeated measurement ANCOVAs. Since the overall levels of character strengths might influence the results, we entered the first unrotated factor as an additional covariate (which only led to small changes in the results). Results are given in **Table 6**.

The table shows that stronger deviations from the average profile went along with stronger benefits in the SS-interventions, while the deviation did not have an influence on depressive symptoms, and had no effects on the LS condition. Hence, having a somewhat atypical profile (in comparison to those tested by Ruch et al., 2010) was associated with greater benefits for those working on their SS.

Discussion

The present study extends the knowledge on the effectiveness of strengths-based interventions in several ways. As in earlier studies, an intervention based on one's SS was effective in increasing happiness. Therefore, the identification and usage of one's SS in a new way seems to be an effective way to achieve sustainable changes in well-being—even if participants were not explicitly

TABLE 5 | Moderating effects of character strengths at baseline on happiness and depressive symptoms.

	Happiness					Depressive symptoms				
	PC comparison		Separate analyses			PC comparison		Separate analyses		
	SS	LS	SS	LS	PC	LS	SS	SS	LS	PC
df	251	251	116	116	134	251	251	116	116	134
Character strengths										
Creativity	0.88	0.63	1.39	0.99	0.04	0.88	−0.48	0.71	−1.01	−0.53
Curiosity	−0.65	−0.03	1.07	1.68	2.04*	1.09	0.00	−0.47	−1.87	−2.37*
Open mind	−0.76	−0.52	−0.15	0.18	0.97	0.19	−0.53	−0.28	−1.38	−0.69
Learning	1.02	0.70	2.16*	1.45	0.52	−1.93	−0.93	−2.71**	−1.23	−0.02
Perspective	−0.95	0.63	−0.16	1.53	1.02	0.34	−2.15*	−0.45	−3.32**	−1.01
Bravery	−0.79	0.26	0.03	1.09	1.05	1.12	−0.62	0.39	−1.59	−1.42
Persistence	1.79	1.99*	2.67**	2.76**	−0.16	−0.32	−2.04*	−1.32	−3.74***	−1.58
Honesty	−1.26	0.41	−0.88	1.20	0.75	1.35	−0.82	0.58	−2.24*	−1.38
Zest	−0.81	0.15	0.69	1.85	1.85	1.29	−0.22	−0.41	−2.37*	−3.00**
Love	−0.24	1.66	0.88	3.17**	0.93	−0.38	−2.35**	−1.07	−3.64***	−0.61
Kindness	0.17	1.73	0.62	2.52*	0.24	−0.40	−2.42**	−0.81	−3.56**	−0.33
Social I	−1.07	1.10	−0.05	2.67**	1.46	0.95	−2.22*	0.11	−4.16***	−1.41
Teamwork	0.76	0.55	2.05*	1.41	0.70	−0.05	−1.23	−1.13	−2.72**	−0.96
Fairness	0.56	1.17	1.47	2.17*	0.83	−0.16	−1.23	−0.98	−2.38*	−0.85
Leadership	0.06	0.08	1.57	1.30	1.37	−0.14	−0.52	−1.56	−1.93	−1.46
Forgiveness	0.27	2.11*	1.09	3.20**	0.66	0.22	−1.95	−1.00	−3.54**	−1.58
Modesty	1.44	0.94	1.26	0.67	−0.65	−0.57	−1.59	0.16	−1.23	1.01
Prudence	−0.19	0.04	0.08	0.36	0.36	0.06	−1.05	−0.08	−1.59	−0.17
Self-R	−0.93	1.25	0.36	3.20**	1.59	0.26	−1.07	−1.69	−3.39**	−2.19*
Beauty	1.23	1.10	1.16	0.82	−0.80	−1.09	−1.53	−0.08	−0.68	1.51
Gratitude	−1.05	0.68	−0.07	2.09*	1.35	0.27	−0.55	−0.32	−1.27	−0.87
Hope	−1.74	0.23	−1.31	1.43	1.36	2.53*	−0.43	1.49	−2.36*	−2.81**
Humor	−1.69	0.88	−1.62	1.6 9	0.55	1.53	−1.74	1.21	−3.13**	−1.06
Religion	−1.11	0.00	−0.29	1.01	1.17	−0.01	−1.10	0.49	−0.89	−0.52
5-Factor solution										
Emotional	−1.88	0.60	−1.35	1.77	1.40	2.15*	−1.35	0.88	−3.35**	−2.74**
Interpersonal	0.34	1.11	1.45	2.20*	0.83	−0.30	−1.58	−1.23	−2.99**	−0.80
Restraint	0.16	0.46	0.37	0.75	0.20	−0.12	−1.18	−0.38	−1.72	−0.20
Intellectual	1.03	−0.10	1.83	0.21	0.33	−1.12	−0.05	−1.24	0.27	0.33
Transcendence	−0.66	0.80	−0.68	1.19	0.05	0.23	−0.90	0.92	−0.47	0.61
2-Factor solution										
Heart vs. Mind	0.52	−0.68	0.08	−1.39	−0.51	0.37	0.71	0.52	0.77	0.07
Self vs. Others	0.18	0.32	−0.17	0.19	−0.23	−0.72	0.03	−0.16	0.60	0.91

All values are t-scores. PC comparison = character strength/strength factor × condition (0, placebo control condition; 1, signature/lesser strengths-intervention) and the character strength/strength factor as predictor of the happiness/depression scores after the intervention (all follow-ups averaged), when controlling for pretest scores in happiness/depression and the character strength/strength factor; separate analyses = prediction of happiness/depression scores after the intervention (all follow-ups averaged) by the character strength/strength factor when controlling for pretest scores in happiness/depression, for each condition separately; SS, signature strengths-intervention; LS, lesser strengths-intervention; PC, placebo control condition. Open mind = open mindedness; learning = love of learning; social I, social intelligence; self-R, self-regulation; beauty, appreciation of beauty and excellence; religion, religiousness.
*p < 0.05; **p < 0.01; ***p < 0.001 (two-tailed).

informed that they were working on their SS. This was found for happiness, but also for single-item ratings on different domains of well-being. Hence, this study shows that strengths-based interventions also affect the SLD (i.e., for the SS-intervention the satisfaction with life in general, and the satisfaction with one's health). Moreover, the SS-intervention was associated with seeing better general living conditions, and it also reduced the discrepancy between the perceived conditions and the satisfaction with

them in various life domains (i.e., life in general, and the leisure, and social domains). Of course, we do not know from the current data whether the objective living conditions truly have changed. However, the finding clearly supports the notion that it may be fruitful to study effects not only for happiness in general, but also for specific facets. The latter should not only be tested by self-reports, but also by considering reports from knowledgeable others and other more objective markers.

TABLE 6 | Moderating effects of the deviation from a normative profile.

	PC comparison		Separate analyses		
	SS	**LS**	**SS**	**LS**	**PC**
df	251	251	116	116	134
Happiness	2.03*	−0.50	2.27*	−1.44	−0.55
Depression	−0.17	0.76	−0.63	1.18	−0.32

All values are t-scores. The deviation from an average profile was computed as the Euclidian distance between the average scores (as reported by Ruch et al., 2010) and an individual's strength scores; PC comparison = interaction between condition (0 = placebo control condition, 1 = signature/lesser strengths-intervention) and the deviation from an average profile as predictors of the happiness/depression scores after the intervention (all follow-ups averaged), when controlling for pretest scores in happiness/depression and the deviation from an average profile; separate analyses = prediction of happiness/depression scores after the intervention (all follow-ups averaged) by the deviation from an average profile when controlling for pretest scores in happiness/depression, for each condition separately; SS, signature strengths-intervention; LS, lesser strengths-intervention; PC, placebo control condition.
*p < 0.05 (two-tailed).

It is important to acknowledge that findings from our study *cannot* be seen as a replication of the standard "Using SS in a new way"-intervention (see, e.g., Seligman et al., 2005; Mongrain and Anselmo-Matthews, 2012; Gander et al., 2013), but we tested one of its variants. We used the same instruction for the participants in our signature and LS-intervention and only indicated that we selected five strengths for the respective intervention, without further elaborating on the rationale for this selection. When we compared the results with the original instruction, we found that the increases in happiness were observed for a shorter time period (up to 1 month, whereas after 3 months a trend in the expected direction was observed), whereas only short-term reductions in depressive symptoms were found. Of course, our findings warrant further investigation and replication; using the available data we cannot answer the question of whether differences are due to the fact that our participants were not informed that the assigned strengths were their SS, or whether other factors also play a role. It cannot be ruled out, however, that knowing whether the strengths are SS or not might have an effect on *how* participants conduct the intervention (i.e., invest more or less effort), which in turn was previously found to have an impact on the effectiveness of the intervention (e.g., Proyer et al., 2015). One might also argue that differences in the way people work with this intervention in comparison with the original instruction might be small because people will notice whether they "posses" a strength or not (see Peterson and Seligman, 2004), or will have at least an implicit understanding of what their strengths are or not. This, however, needs to be tested further in future studies.

It seemed interesting to us that the findings for the intervention focusing on the LS were in the same direction as the SS-intervention; the intervention led to highly comparable increases in happiness and also increased the satisfaction with one's health and the perceived quality of general living conditions, and reduced the discrepancy between the perceived quality of the living conditions and the satisfaction with them. Also, the LS-intervention did not differ from the SS-intervention in terms of the enjoyment or perceived benefit. However, we do not argue that the two types of interventions are identical. For example,

one might argue that working on SS might be more beneficial for other outcomes, such as fostering *empowerment* (i.e., the perceived meaning, competence, autonomy, and impact; Spreitzer, 1995) than working on LS, since people more easily identify with and work on their SS. Thus, future studies should also consider a broader range of outcome variables.

The finding that we observed an increase in fit between the satisfaction with life in general and the perceived quality of the living conditions in both interventions can mainly be traced back to an increase in the satisfaction ratings. The ratings for the perceived quality of the conditions were rather stable across all time points; in general, the quality of the conditions was rated higher than the satisfaction with them. Thus, this increase in the fit might indicate that due to the intervention the participants were more able to use their potential; i.e., to appreciate the already high quality of living conditions. Of course, this finding needs to be replicated and more objective measures of the living conditions are clearly warranted.

We found strong evidence that character strengths have an impact on the effectiveness of the interventions. For example, if data was split for those high and low in virtuousness based on the VIA-IS (median split in the first unrotated principal component) different patterns emerged for the two groups. In short, for those seeing themselves as virtuous, working with their LS was more effective, while for those that saw themselves as low in their virtuousness, the SS-intervention led to greater effects. Hence, the general level of (self-ascribed) strengths possession may play a role if thinking of increasing the person × intervention-fit (see, e.g., Lyubomirsky et al., 2005; Schueller, 2010; Lyubomirsky and Layous, 2013; Proyer et al., 2015). These findings may also help to understand mixed results in replications of the initial study by Seligman et al. (2005) depending on the strengths outlet of the participants. Thus, pending further replication this finding can have practical implications for tailoring strengths interventions to the participants. As mentioned earlier we do not advocate the interpretation of a general score out of the VIA-IS, but the present analysis has shown that computing such a score for research purposes might facilitate the interpretation of data from strength-based interventions.

For the LS-intervention, a moderating effect was also found at the level of single character strengths; those higher in certain strengths benefited more from the intervention (increases in happiness and reduction in depressive symptoms) than those low in these strengths. For the SS-intervention, only a few strengths moderated the effectiveness of the intervention. The only strength that moderated the effects of both strengths-interventions was *persistence*. This strength may be a good predisposition to continuously work on ones strengths and keeping the focus on the task even when distractions are present. Furthermore, we found smaller effects in the LS condition for those who had self-regulation in their bottom-five strengths. Both strengths are robustly related and show high loadings on the "strengths of restraint"-factor. One might argue that these strengths play an important role in all interventions – not just those examined in the present study. Proyer et al. (2013b) reported similar findings and emphasized the importance of self-regulation in positive interventions. Potentially, the effects of

these variables disappear when an intervention is administered in different settings that offer more guidance than the self-administering of interventions as in the present study. This might be important for individuals with low scores in these strengths. Future studies will be needed to test this assumption. Otherwise, we found for both strengths conditions, that they were more effective for those with *fewer* strengths of restraint among their SS. Thus, the findings suggest that a minimum level of these strengths is necessary for an individual to be able to benefit from a self-administered intervention, but scoring too high in these strengths might have detrimental effects on the effectiveness of an intervention.

Finally, we found that those participants whose character strengths-profile differs from a profile derived from a large sample collected for the adaptation of the German-language version of the VIA-IS (Ruch et al., 2010), benefit more from the SS-intervention than those whose profile is closer to a normative one – independently from their overall virtuousness. Thus, this means that the SS-intervention works better for those people who have some strengths that are especially high or low in comparison to the "normative" profile. Of course, the interpretation of this deviation is difficult from a psychological perspective, but it seems as if having a "different" strength profile than the sample of comparison is beneficial for working with strengths. It is important to highlight that our analysis does not allow to say that this refers to single peaks in the sense of *exceeding* the profile in ones strengths—also deviations in the other directions are possible.

At this point it also needs mentioning that the strategy of identifying the SS via the rank order of the mean scores in the VIA-IS is only an approximation and other strategies may be more precise for their identification. For example, Peterson and Seligman (2004) also describe the *Values-in-Action Strengths Interview* (VIA-SI), which was developed for the identification of SS. The usage of the mean scores is a limitation of this study (as it is for other studies applying this strategy for deriving SS). Strengths ranked at sixth or seventh place may numerically be different, but not statistically different from the one ranked at fifth

place. If, for example, a participant would say that the strength ranked at position six in the rank-ordered VIA-strengths feels more like a SS to him/her than the one ranked on fifth position, than the effect may be even stronger when working with this strength in the intervention. Therefore, the approximation of using mean scores for the identification of the SS in intervention studies has proven to work well for the purpose of this type of research, but may not be the best possible way of identifying them. Another limitation is the imbalance in the gender distribution in our sample (more women) and their comparatively high educational level. Although there are no reports on major gender-differences in the effectiveness for PPIs, findings should be interpreted conservatively because of this imbalance. We also tested a set of specific moderators, but others (e.g., broader personality variables; see, e.g., Senf and Liau, 2013) may also play a role. Recent research (Ruch and Proyer, 2015) has also suggested that the factor-analytically derived solution we used in this study as mediators may better be replaced with a different solution. Furthermore, it would have been interesting to compare the interventions conducted in this study directly to the original "Using SS in a new way"-intervention to test the differences in more detail.

In line with earlier findings (e.g., Haidt, 2002), we argue that both, working on the SS as well as working on the LS, is beneficial for increasing happiness. However, when also considering the individual character strengths-profile of the participants (such as the overall level of virtuousness), the effectiveness of the intervention might depend on whether one is working on one's SS or the LS. Therefore, it might be fruitful to take an individual's character strengths into account when assigning an intervention to a person in order to enhance its effectiveness.

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Personality and well-being in adolescents

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Different profiles of the character dimensions of self-directedness, cooperativeness and self-transcendence result in different levels of wellbeing among adults. However, the influence of the multidimensional character profiles on adolescents' composite wellbeing remains unexplored. This study builds on previous studies with adults, and examines the linear and non-linear associations between the dimensions of the psychobiological model of personality and well-being in adolescents. Participated in this study 1540 adolescents ($M = 15.44$, $SD = 1.731$). Personality was assessed using the Temperament and Character Inventory (TCI). Well-being was evaluated in a composite perspective: satisfaction with social support, health-related quality of life, satisfaction with life and affect. Variable-centered and individual-centered analyses were performed. Self-directedness was strongly associated with all dimensions of affective and cognitive well-being regardless of the other two character traits. Cooperativeness was associated with non-affective well-being and with positive affect, but only when associated to elevation of Self-directedness and Self-transcendence. Self-Directedness and Cooperativeness explained 15.5% of the non-affective well-being variance. Self-Directedness and Self-Transcendence explained 10.4% of the variance in affective well-being. This study confirms the tendencies found in previous studies with adults from other societies, where each character dimension gives an independent contribution to well-being depending on the interactions with other Character dimensions. Also, this study highlights the importance of considering the non-linear influences of the character dimensions in understanding of adolescents' wellbeing. These results have strong implications for youth positive mental health promotion, including for school-based policies and practices.

Keywords: personality, character, adolescents, psychobiological model of personality, wellbeing, health, wellness, happiness

This study builds on research developed by Cloninger and Zohar (2011) and Josefsson et al. (2011) with adult populations, by describing the non-linear influences of character profiles on well-being in adolescents.

Adolescents well-being is highly associated to several indicators of developmental trajectories (Pyhältö et al., 2010), including engagement with school (Elmore and Huebner, 2010; Ainly and Ainly, 2011; Lewis et al., 2011), academic achievement (Berger et al., 2011), optimism and coping strategies, and is a protective factor against negative indicators of health (Carver et al., 2010). Adolescents with high levels of well-being are more resilient (Gilman and Huebner, 2006; Antaramian et al., 2010), present lower delinquency behaviors and aggression, lower depressive and anxiety symptoms, higher self-esteem, self-efficacy and adaptation (McKnight et al., 2002; Huebner, 2004; Suldo and Huebner, 2004; Antaramian et al., 2010).

Well-being is a multidimensional phenomenon, integrating biological, psychological, social, and spiritual dimensions (Cloninger, 2004, 2006a,b; Lyubomirsky et al., 2005; Bartels and Boomsma, 2009; McDowell, 2010). Wellbeing refers to the emotional and cognitive dimensions of the subjective experience resulting from the individual evaluation of several dimensions of life. Conceptions of well-being vary from Hedonic and Eudaimonic distinct but related and complementary approaches (Keyes et al., 2002; Huppert and Whittington, 2003). Hedonic well-being refers to the emotional dimensions of the individuals' positive life experiencing (Diener, 1984), including absence of negative emotions, presence of positive emotions, life satisfaction and social involvement (Ryan and Deci, 2001). Eudaimonic well-being refers to the harmony between the individuals goals and values and life experiences (Ryff et al., 2004), and is associated to individuals personal development (Ryan and Deci, 2001).

Personality is a significant predictor of mental health (Cloninger et al., 1997; Gestsdóttir and Lerner, 2007; Davydov et al., 2010), including positive mental health/wellbeing (Cloninger and Zohar, 2011; Josefsson et al., 2011; Butkovic et al., 2012). Healthy personality development is related to several aspects of well-being and there is a need for integrating the contributions of personality to well-being on current approaches to mental health (Seligman, 2008; Cloninger, 2012; Vaillant, 2012). Studies using personality models derived from linear factor analyses, such as the Five-Factor Model (FFM) (McCrae and

Costa, 1991; Gutiérrez et al., 2005), found negative associations between Neuroticism and happiness and psychological wellbeing (Stewart et al., 2005; Garcia, 2011), positive associations between Neuroticism and negative affect, between Openness and positive affect and between Conscientiousness and life satisfaction (DeNeve and Cooper, 1998; Garcia, 2011). Extraversion was found to be positively related to positive affect (Diener et al., 2003; Lyubomirsky et al., 2006; Garcia, 2011). Eysenck's dimension of Extraversion was found to be associated to happiness and to loneliness and Neuroticism was negatively correlated to happiness (Cheng and Furnham, 2002). Mixed results of positive relation (Huebner et al., 2004) and absence of relation (Rigby and Huebner, 2005) have been found for the relation between Extraversion and life satisfaction among and adolescents.

However, there is a growing consensus about the need of using genetic-informed and psychobiological personality models, as they are more adequate for describing psychobiological processes underlying behavior than lexical models (Cloninger, 2008b; de Moor et al., 2010; Munafò and Flint, 2011; Veselka et al., 2012).

Cloninger and colleagues developed the psychobiological model of personality which conceptualizes personality as an organization of dynamic and non-linear psychobiological processes (Cloninger et al., 1993). The authors developed age-appropriate instruments of the Temperament and Character Inventory (TCI), which measures temperament and character dimensions. Temperament refers to individual differences in behavioral conditioning of responses to basic emotional stimuli related to fear, anger, disgust, and ambition. There are 4 TCI temperament dimensions: Novelty Seeking (NS) (i.e., impulsive vs. deliberate); Harm Avoidance (HA) (i.e., anxious vs. risktaking); Reward Dependence (RD) (i.e., sociable vs. aloof), and Persistence (PS) (i.e., determined vs. easily discouraged). Each extreme of temperament has advantages and disadvantages depending on the situation (Cloninger et al., 1993; Cervone, 2005). Character refers to individual differences in higher order socio-cognitive processes (self-concepts, and intentional values and goals) (Cloninger, 2008a). The 3 dimensions of TCI character are called Self-Directedness (SD) (i.e., purposeful vs. aimless), Cooperativeness (CO) (i.e., helpful vs. hostile), and Self-Transcendence (ST) (i.e., holistic vs. self-centered) (Cloninger et al., 1993). Because Temperament refers to the tendency of responding to basic emotional stimuli, it is more strongly related to hedonic well-being (Cloninger et al., 1998). High levels of Extroversion of the Five-Factor Model (which corresponds to low scores of the psychobiological model personality dimension of HA, Cloninger, 2010) tend to be more respondents to positive affect (Larsen and Eid, 2008). Also, high levels of Neuroticism (which corresponds to low persistence and low self-directedness (Cloninger, 2010) are associated to more reactivity to negative affect (Larsen and Eid, 2008). These results are consistent to those found in adolescents, where high levels of Harm Avoidance predicted low levels of Positive Affect (Garcia, 2011). By another hand, Character refers to higher order socio-cognitive self-regulatory processes, and is more associated to the Eudaimonic well-being (Cloninger, 2004). Both Temperament and Character are associated to physical and emotional health, although the evidences for the associations between temperament and health are less consistent (Ryff et al., 2004; Westerhof and Keyes, 2010).

Two recent population-based studies in Israel and Finland used the multidimensional psychobiological personality profiles to assess the linear and non-linear effects of interactions among dimensions on different indicators of well-being (Cloninger and Zohar, 2011; Josefsson et al., 2011). Character dimensions of self-directedness, cooperativeness and self-transcendence shown to be strong predictors of the different aspects of well-being. In the Israeli population-based study Self-directedness was strongly correlated with affective (positive and negative affect) and non-affective (life satisfaction, social support and subjective health) dimensions of well-being. Cooperativeness was especially associated to satisfaction with social support and Self-transcendence predicted positive emotions (Cloninger and Zohar, 2011). Similar findings were found in the Finn population-based study, where personality explained half the variance in non-affective aspects of well-being and two thirds of the variance in affective dimensions of well-being (Josefsson et al., 2011). Besides, each character dimension independently contributes to well-being, depending of interactions among dimensions, which means that the character profiles are strongly associated with individual differences in well-being (Josefsson et al., 2011). However, in the Finn study, Self-Transcendence was associated with both positive and negative affect, while in the Israeli study it was only associated with positive affect, which suggest that the effect of Self-transcendence on well-being depends on cultural and religion differences (Josefsson et al., 2011).

Adolescence is a developmental period characterized by marked transformations in psychobiological processes underlying behaviors, due to the maturation of the neuroanatomical circuitries, the specificities of the contexts and the development tasks associated (autonomy, intimacy, etc.). Adolescents' psychobiological organizations are modulated by interactions among individual and context dimensions resulting in different pattern of functioning, from positive to negative functioning. Although personality development is characterized by continuity, temperament and character dimensions have different development patterns (Josefsson et al., 2013a), with character dimensions exerting a significant influence on individuals functioning, including on wellbeing (Cloninger and Zohar, 2011; Josefsson et al., 2011). In spite of its importance to the promotion of adolescents positive functioning, the influences of different combinations of character dimensions on adolescents' wellbeing remain unexplored. Childhood personality is a significant predictor of competence and resilience in adulthood (Shiner and Masten, 2012), and dimensions of positive mental health systematized by Vaillant (2012) are involved in cascades of children and adolescents positive and negative development (Blandon et al., 2010; Bornstein et al., 2010). Because well-being is a central dimension on positive development cascades (Lewin-Bizan et al., 2010), a developmental approach to mental health requires the understanding of the developmental associations between the psychobiological processes underlying personality and well-being also in earlier stages of development, including early and middle adolescence. In addition, a fully understanding of adolescents health requires the use of genetic-, neuroanatomic, and psychological-informed frameworks (Burnett et al., 2011; Sturman and Moghaddam, 2011; Eldreth et al., 2013; Richards et al., 2013).

Several authors are arguing that Character dimensions need to be considered in the understanding of the associations between personality and well-being (Cloninger et al., 2010; Cloninger and Zohar, 2011; Garcia, 2011; Garcia and Moradi, 2011). Recent studies conducted by Garcia and colleagues found that dimensions of the psychobiological model of personality are strong predictors of adolescents wellbeing. Different temperament and character dimensions registered different associations with well-being. Self-directedness showed to be the most important predictor of adolescents' wellbeing, also because it mediated the relationship between temperament dimensions (e.g., Persistence) and wellbeing (Garcia, 2011; Garcia and Moradi, 2011; Garcia et al., 2012).

Rather than a linear phenomenon, the development of well-being encompasses complexes and non-linear interactions between personality dimensions involved in adaptation. Healthy personality development depends on the growth in self-awareness (Cloninger, 2008a) and on the differentiation of dimensions such as strengths of character, maturity, positive emotional balance, socio-emotional intelligence, life satisfaction (true happiness), and resilience (Vaillant, 2012). The same personality dimensions can result in different outcomes (i.e., multi-finality), and different configurations of personality dimensions can lead to the same outcome (i.e., equifinality) (Cloninger and Cloninger, 2011). Therefore, because of the complexity of developmental psychobiological processes, a fully understanding of effects of personality dimensions on well-being requires person-centered approaches, because it allows for the understanding of how different personality profiles (rather than separate dimensions) affect the individuals' subjective experience.

As described by previous studies with adults conducted by Cloninger and colleagues, the personality influences on well-being are better described throughout non-linear associations and combinations between different temperament and character dimensions, rather than linear associations only (Cloninger and Zohar, 2011; Josefsson et al., 2011). In spite of that, no study had evaluated the non-linear associations of Character dimensions of self-directedness, cooperativeness and self-transcendence with well-being in adolescents, which are significant predictors of physical, mental, and social components of health and happiness (Cloninger and Zohar, 2011).

The objective of this study was to build on Cloninger and Zohar (2011) and on Josefsson et al. (2011) by describing the non-linear associations between Cloninger' psychobiological model of personality multidimensional character profiles (self-directedness, cooperativeness and self-transcendence) and well-being (measured as a composite indicator of satisfaction with social support, life satisfaction, health-related quality of life and affect) in adolescents.

METHODS

PARTICIPANTS

Participated in this study 1540 Portuguese adolescents aged 12–21 years old ($M = 15.44$, $SD = 1.731$). Adolescents were nearly equally divided by gender (45.2% male; 51.7% female). Those students who did not include the information about the gender were not included in this descriptive of participants' gender.

Participants were also nearly divided by school level (53.8% Middle School; 46.2% Secondary School). The majority of adolescents were enrolled in regular schools ($n = 1197$, 77.7%) and the others ($n = 343$, 22.3%) in vocational schools.

MEASURES

Socio-demographics—Socio-demographic characteristics of adolescents, such as age, parent and mother education, parent and mother occupation, were collected. Students filled out the required socio-economic in the socio-demographics inventory. However, a very substantial proportion of the students did not give information about parents' occupational status, and it was not possible to collect the family's annual/monthly incomes. Because parental education (and especially maternal education) is the strongest predictor of family SES, and it is an acceptable indicator of SES (Bradley and Corwyn, 2002), we considered parents education as the indicator for SES status. Mothers educational attainment in our sample was as follows: 20.7% completed only the 4th grade; 23.2% completed only the 6th grade; 18.6% completed only the 9th grade; 11.8% completed only the 12th grade and 25.7% had a graduation or post-graduation). The fathers' education was similar: 21.8% completed only the 4th grade; 21.7% completed the 6th grade; 17.8% completed only the 9th grade; 12% completed the 12th grade and 26.7% had a graduation or post-graduation. In both mothers and fathers, the percentage of those who had only completed the 6th grade (44% of mothers and 43.5% of fathers) was almost twice those who had a graduation (25.7% of mothers and 26.7% of the fathers).

TCI-R

The Temperament and Character Inventory—Revised (TCI-R; Cloninger, 1999) is a comprehensive personality inventory for adults aged 17 and older. It has 240-items rated by a 5-point Likert response format (Completely False to Completely True). It measures 4 dimensions of temperament—Novelty Seeking (NS), Harm Avoidance (HA), Reward Dependence (RD) and Persistence (PS)—and 3 of character—Self-Directedness (SD), Cooperativeness (CO) and Self-Transcendence (ST)—comprised of 29 subscales. The TCI-R Portuguese version has a good internal consistency for all the dimensions with coefficient values for Cronbach *alpha* above 0.84, except for Novelty Seeking (NS) and Reward Dependence (RD) (0.79 and 0.80, respectively) (Moreira et al., in preparation).

JTCI

The Junior Temperament and Character Inventory (JTCI; Luby et al., 1999) is a 108 item inventory for parent-report, teacher-report, or self-report, and it uses a true-false format to simplify responses in younger children. The Junior Temperament and Character Inventory (JTCI) measures the 7 major dimensions of the psychobiological model of Temperament and Character, throughout age-appropriate items corresponding to all the adult TCI scales. In the validity based studies of the Portuguese version of the JTCI, 2 modifications were made to the American version: (1) all items were rated on a 5-point Likert scale with 5 options (1 = completely False, 2 = mostly False, 3 = cannot decide, 4 =

mostly True, and 5 = completely True); (2) 16 additional items were added or changed, in order to better accommodate cultural specificities [2 items were added to the Reward Dependence and 9 items were added to the Self-Transcendence scale (5) items to the subscale of Fantasy and Imagination (ST1) and (4) items to the Spirituality subscale (ST2)]. These changes were made in accordance with the author of the instrument, and they did not change the constructs of the dimensions. The JTCI Portuguese version has 127 items, and has moderate to strong internal consistency for all dimensions: Novelty Seeking: α = 0.77; Harm Avoidance: α = 0.83; Reward Dependence: α = 0.62; Persistence: α = 0.50; Self-Directedness; α = 0.75; Cooperativeness; α = 0.78; and Self-Transcendence: α = 0.69 (Moreira et al., 2012b).

Character profiles

In order to describe the non-linear influences of different character dimensions combinations, we relied on Cloninger's proposal for 8 character profiles: SCT (Creative profile; elevation on the 3 dimensions of Self-Directedness); SCt (Organized profile; elevation on Self-Directedness and Cooperativeness and low scores on Self-Transcendence); ScT (Fanatical profile; High Self-Directedness and Self-Transcendence and low Cooperativeness); Sct (Autocratic profile; High Self-Directedness and low Cooperativeness and Self-Transcendence); sCT (Moody profile; low Self-Directedness and high Cooperativeness and Self-Transcendence); sCt (Dependent profile; low Self-Directedness and Self-Transcendence and high Cooperativeness); scT (Disorganized profile; low Self-Directedness and Cooperativeness and high Self-Transcendence); and sct (Depressive profile; low scores in the 3 dimensions of Self-Directedness, Cooperativeness and Self-Transcendence) (Cloninger, 2004; Cloninger and Zohar, 2011; Josefsson et al., 2011). As in previous studies, the participants were distributed in 2 groups: those presenting scores above the mean, and those presenting scores below the mean for each of the character dimensions. Then, they were grouped in the 8 possible combinations of profiles (**Table 1**) (Cloninger, 2004; Cloninger and Zohar, 2011; Josefsson et al., 2011).

Life satisfaction

To assess the life satisfaction we used the Brief Multidimensional Students' Life Satisfaction Scale (Huebner et al., 2011). It includes six items that assesses six different domains of life (Family, Friends, School, Self, Environment, Life in general) by a seven-point Likert-like scale (Terrible; Unhappy; Unsatisfactory; Partly unsatisfactory and Partly satisfactory; Satisfactory; Friendly, Fantastic).

Social support

The social support was assessed by the Portuguese version of the Brief Version of the Satisfaction with Social Support Scale for Children and Adolescents (Gaspar et al., 2009a,b). The scale includes six items that assesses the satisfaction with social support (e.g., "I am satisfied with the amount of friends I have") and six items that assesses the need for activities related to social support (e.g., "My friends do not come to me as often as I liked"). The items are rated on a five-point scale. Scale reliability was α = 0.70.

Affect

The Positive and Negative Affect Scale (PANAS, Watson et al., 1998) was used to assess the positive and negative states which are endorsed on a five-point Likert-like scale. In our study, the scale registered good internal consistency values (with alphas of 0.90 and 0.92 for positive and negative affect scales, respectively), similar to those found in the study of the Psychometric characteristics of the Portuguese version (Galinha and Pais-Ribeiro, 2005).

Quality of life

The health-related quality of life was assessed with KIDSCREEN-10 (Erhart et al., 2009). The KIDSCREEN-10 is a brief instrument that assesses mental health and well-being in children/adolescents aged between 8 and 18 years. It includes 10 items (e.g., "Felt fit and well"; "Felt full of energy"; "felt sad") answered on a Likert scale with five response options (from 1—"never" to 5—"always"). The Portuguese version (Matos et al., 2012) has good psychometric characteristics with a internal consistency of 0.78.

Composite health index and happiness index

In order to examine the associations between character profiles and the two higher order dimensions of wellbeing, we estimated the index of Composite Health and of Happiness as indicators of non-affective (wellness) and affective (happiness) wellbeing, respectively. We relied on the proposals of Cloninger and Zohar (2011), and of Josefsson et al. (2011) for this estimation. The Composite Health Index refers to the mean of the Satisfaction with social support, Satisfaction with life, and Health related quality of life. The Happiness Index was estimated as the score of the Positive affect minus the score of the Negative affect; it reflects, therefore, the emotional tonality of the individuals' experience: the salience of the positive emotions (desirably present) and of the negative emotions (desirably absence).

PROCEDURE
Data collection

The individuals were recruited accordingly to the snow ball technique for the selection of non-randomized samples. Adolescents were contacted by researchers in the school context. All students were asked to deliver the informed consent to their parents, so they could decide if they will consent their adolescent to take part of the study. Besides parents' informed consent, 18 older or

Table 1 | Frequency distribution of the TCI (measured both with the JTCI and the TCI-R versions) character profiles.

Character profile	N	Valid (%)
sct—depressive	327	21.20
scT—disorganized	212	13.80
sCt—dependent	111	7.20
sCT—moody	155	10.10
Sct—autocratic	150	9.70
ScT—fanatical	79	5.10
SCt—organized	261	17
SCT—creative	244	15.90

less were also asked if they wanted to participate in the study. Adolescents with 18 years or more were asked to sign in the informed consent. Those adolescents who brought the informed consent signed in by their parents (under 18) or by themselves (adolescents with 18 years old or more), and who wanted to participate in the study were gathered in a group session of 1 h, in classrooms. Then the socio-demographic, the wellbeing and the personality questionnaires were distributed to students. For 17 olders or less, the JTCI was distributed, for 18 older or more the TCI-R was distributed. No extra time was needed, and some discomfort was observed from some participants. Adolescents were reminded that they could drop out without completing the questionnaires. This only happened in a few cases (who were not included in the study), and the great majority of the participants did not express any disturbance or discomfort. In order to protect the participants' identity, the questionnaires were precoded by the researchers with a code for each school, for school year, and for student. Then the researchers distributed the questionnaires already precoded.

Statistical analysis

All data were carefully double-checked for possible miscoding, distribution of values, and updating of missing values prior to analysis (some items had missing data, and we replaced them by the series mean method). In order to assess the non-linear associations between personality configurations and well-being, character profiles were defined. The participants were grouped according to all the possible combinations of high and low scores in each one of the character dimensions. Our non-linear analyses were based on the Cloninger's proposal for character profiles (Cloninger, 2004; Cloninger and Zohar, 2011; Josefsson et al., 2011). Pearson's correlations, principal components analysis, multiple regression analyses and t-tests were all carried out using the Statistical Package for Social Sciences (SPSS) for Windows, version 18.0.

RESULTS

PERSONALITY DIMENSIONS AND WELL-BEING BY SCHOOL LEVEL AND CURRICULUM TYPE

Personality dimensions, measures of well-being, Happiness Index (HI) and Composite Health Index (CHI) were examined by curriculum type (**Table 2**) and school level (**Table 3**). Middle school students presented higher Novelty Seeking ($t = 3.56$; $p = 0.00$), Self-Transcendence ($t = 4.93$; $p = 0.00$), Life Satisfaction ($t = 2.12$; $p = 0.03$), Health-related quality of life ($t = 6.19$; $p = 0.00$), Positive Affect ($t = 5.30$; $p = 0.00$), and Negative Affect ($t = 2.30$; $p = 0.02$). Conversely, Middle school students registered lower Reward Dependence ($t = -3.26$; $p = 0.00$), Persistence ($t = -3.15$; $p = 0.00$), Self-Directedness ($t = -6.52$; $p = 0.00$), Cooperativeness ($t = -5.22$; $p = 0.00$) and Social Support ($t = -2.67$; $p = 0.01$) comparatively with High school students.

Students who attended regular schools presented higher Reward Dependence ($t = 5.49$; $p = 0.00$), Persistence ($t = 4.54$; $p = 0.00$), Self-Directedness ($t = 5.03$; $p = 0.00$), Cooperativeness ($t = 5.63$; $p = 0.00$), Life Satisfaction ($t = 3.82$; $p = 0.00$), Health-related quality of life ($t = 5.99$; $p = 0.00$),

Positive Affect ($t = 3.92$; $p = 0.00$), and Social Support ($t = 4.14$; $p = 0.00$). Conversely, adolescents attending regular schools registered lower Novelty Seeking ($t = -2.30$; $p = 0.02$), Harm Avoidance ($t = -3.44$; $p = 0.00$) and Negative Affect ($t = -3.09$; $p = 0.00$) comparatively with students from vocational schools. However, the effect sizes were small for all these differences.

CORRELATIONS BETWEEN MEASURES OF WELL-BEING

The relationships among positive and negative affect, life satisfaction, perceived social support, and perceived health-related quality of life, were examined (**Table 4**). Positive and Negative Affectivity were weakly and negatively correlated ($r = -0.28$). The correlations between non-affective measures showed that health-related quality of life and life satisfaction were moderately correlated ($r = 0.56$), and that the social support were also moderately correlated with these measures ($r = 0.44$ and $r = 0.49$, respectively). Each individual measure of health was strongly correlated with Composite Health Index (CHI, $r = 0.77$ to $r = 0.83$). The Happiness Index was positively correlated with all indicators ($r = 0.52$ to $r = 0.73$) except with negative affect which registered a negative correlation ($r = -0.86$). The Composite Health Index (CHI) and the Happiness Index (HI) were moderately correlated ($r = 0.66$).

CHARACTER PROFILE AND POSITIVE AFFECT

The standardized positive affect scores were compared among the participants in the 8 character profiles (**Figure 1**). Analysis of variance revealed highly significant differences among the groups ($F = 15.89$, $p = 0.00$). Bonferroni corrected comparison between groups showed that the creative (SCT) profile was significantly higher in positive affect than in all other profiles with the exception of autocratic (Sct) and fanatical (ScT) profiles. The depressive profile (sct) was significantly lower in positive affect than creative (SCT) and fanatical (ScT) profiles.

We evaluated the non-linear influence of each of the character dimensions on positive affect by paired comparisons of the effect of extremes of each character dimension when the other two were controlled. Higher Self-directedness was consistently associated with higher positive affect for each of the four possible configurations of Self-Transcendence and Cooperativeness. With regard to Cooperativeness and Self-Transcendence, only the comparison between the creative (SCT) and organized (SCt) profiles reached a statistically significant difference ($t = 3.83$, $p = 0.00$), with the Self-Transcendence associated with higher positive affect (**Table 7**).

CHARACTER PROFILE AND NEGATIVE AFFECT

Analysis of negative affect variance among the participants in the 8 character profiles showed that the groups were significantly different one from another ($F = 9.84$, $p = 0.00$). **Figure 2** shows the standardized scores. Bonferroni range correction showed that the first four character profiles with high Self-directedness [Creative (SCT); Organized (SCt); Fanatical (ScT); and Autocratic (Sct)] were significantly lower than the other four character profiles [Moody (sCT); Dependent (sCt); Disorganized (scT); and Depressive (sct)] with exception of the comparison between

Table 2 | TCI dimensions (measured both with the JTCI and the TCI-R versions), measures of well-being, Happiness Index and Health Index by school level.

	Middle School (n = 829)		High School (n = 711)		t	p	Cohen's d	Effect size r
	Mean	SD	Mean	SD				
Novelty Seeking	0.08	1.03	−0.09	0.96	3.56	0.00	0.18	0.09
Harm Avoidance	−0.02	0.97	0.03	1.03	−0.89	0.38	−0.04	−0.02
Reward Dependence	−0.08	0.97	0.09	1.03	−3.26	0.00	−0.17	−0.08
Persistence	−0.07	0.97	0.09	1.03	−3.15	0.00	−0.16	−0.08
Self-Directedness	−0.15	1.00	0.18	0.97	−6.52	0.00	−0.33	−0.16
Cooperativeness	−0.12	1.01	0.14	0.96	−5.22	0.00	−0.27	−0.13
Self-Transcendence	0.12	0.99	−0.13	0.99	4.93	0.00	0.25	0.12
Life Satisfaction	0.05	1.03	−0.06	0.97	2.12	0.03	0.11	0.05
Health-related quality of life	0.14	1.05	-0.17	0.91	6.19	0.00	0.32	0.16
Positive Affect	0.12	1.04	−0.15	0.93	5.30	0.00	0.27	0.14
Negative Affect	0.05	1.09	−0.06	0.87	2.30	0.02	0.12	0.06
Social Support	-0.06	1.03	0.07	0.97	-2.67	0.01	−0.14	−0.07
Happiness Index (HI)	0.03	1.06	−0.03	0.93	1.20	0.23	0.06	0.03
Composite Health Indicator (CHI)	0.04	0.83	−0.05	0.78	2.30	0.02	0.12	0.06

CHI (Composite Health Index) = mean of satisfaction with life, health- related quality of life and social support; HI (Happiness Index) = positive affect—negative affect.

Table 3 | TCI dimensions (assessed by the JTCI and the TCI-R versions), measures of well-being, Happiness Index and Health Index by curriculum type.

	Regular (n = 1197)		Vocational (n = 343)		t	P	Cohen's d	Effect size r
	Mean	SD	Mean	SD				
Novelty Seeking	−0.03	1.010	0.11	0.97	−2.30	0.02	−0.14	−0.07
Harm Avoidance	−0.05	1.0	0.16	0.98	−3.44	0.00	−0.21	−0.11
Reward Dependence	0.07	1.02	−0.26	0.89	5.49	0.00	0.35	0.17
Persistence	0.06	1.0	−0.21	0.97	4.54	0.00	0.28	0.14
Self-Directedness	0.07	0.98	−0.24	1.0	5.03	0.00	0.30	0.15
Cooperativeness	0.08	0.96	−0.27	1.08	5.67	0.00	0.33	0.16
Self-Transcendence	0.01	1.0	−0.02	0.99	0.57	0.57	0.04	0.02
Life Satisfaction	0.05	0.97	−0.18	1.07	3.82	0.00	0.23	0.11
Health-related quality of life	0.08	0.96	−0.28	1.09	5.99	0.00	0.36	0.17
Positive Affect	0.05	0.95	−0.19	1.13	3.91	0.00	0.23	0.11
Negative Affect	−0.04	0.97	0.15	1.10	−3.09	0.00	−0.18	−0.09
Social Support	0.06	0.99	−0.20	0.99	4.14	0.00	0.25	0.13
Happness Index (HI)	0.06	0.94	−0.20	1.14	4.30	0.00	0.25	0.12
Composite Health Indicator (CHI)	0.06	0.78	−0.22	0.88	5.76	0.00	0.35	0.17

CHI (Composite Health Index) = mean of satisfaction with life, health-related quality of life and social support; HI (Happiness Index) = positive affect—negative affect.

fanatical (ScT) and dependent (sCt) profiles ($md = -0.40$, $p = 0.15$).

The evaluation of the non-linear interactions of character dimensions on negative affect showed that the Self-directedness had a significant inverse association with negative affect for each of the four possible configurations of the other two character traits (**Table 7**). Cooperativeness and Self-Transcendence were not associated with lower negative affect in any contrast.

CHARACTER PROFILE AND NON-AFFECTIVE MEASURES
The relationships among our non-affective measures of well-being and character profiles were examined (**Figure 3** and **Table 5**). Analysis of variance revealed that the profile groups differed significantly for the three non-affective measures of well-being: life satisfaction ($F = 14.64$, $p = 0.00$), perceived social support ($F = 19.99$, $p = 0.00$) and health-related quality of life ($F = 15.32$, $p = 0.00$). *Post-hoc* group comparisons using the

Bonferroni correction showed that for life satisfaction the means of the creative (SCT) and organized (SCt) profiles were significantly higher than those of all profiles that were not high in Self-Directedness. Also the mean of depressed (sct), disorganized (scT) and moody (sCT) profiles were significantly lower than those of all profiles that were high in Self-Directedness. For health-related quality of life, all profiles with high Self-Directedness differed significantly from those with low Self-Directedness, with exception of the contrast between fanatical (ScT) and depressive (sct) profiles. For Life Satisfaction all profiles with high Self-Directedness differed significantly from those with low Self-Directedness, with exception of the contrast between fanatical (ScT) and dependent (sCt) profiles. For Social Support, all profiles with high Self-Directedness differed significantly from those with low Self-Directedness, with exception of the contrast between autocratic (Sct) and disorganized (scT), autocratic (Sct) and dependent (sCt), and between fanatical (ScT)

Table 4 | Correlations between measures of well-being.

	1	2	3	4	5	6	7
1. Composite health Index	–						
2. Happiness Index	0.66						
3. Life Satisfaction	0.82	0.52					
4. Health-related quality of life	0.83	0.60	0.56				
5. Positive Affect	0.62	0.73	0.52	0.62			
6. Negative Affect	−0.47	−0.86	−0.34	−0.38	−0.28		
7. Social Support	0.77	0.49	0.44	0.45	0.35	−0.42	–

CHI (Composite Health Index) = mean of satisfaction with life, health-related quality of life and social support; HI (Happiness Index) = positive affect—negative affect; All correlations are significant at p < 0.01.

and dependent (sCt) profiles. Profiles with low self-directedness did not differ from each other and neither did profiles with high self-directedness.

Taking interactions among the character traits into account, higher Self-directedness was associated with greater life satisfaction, health-related quality of life and perceived social support in all contrasts. Cooperativeness and Self-Transcendence had little or no association with any measure of non-affective well-being (**Table 5**).

CHARACTER PROFILE AND COMPOSITE HEALTH INDEX AND HAPPINESS INDEX

The descriptive statistics for Composite Health Indicator (CHI), Hapinness Indicator (HI) and positive and negative affect by character profile are showed in **Table 6** and the analysis of variance showed that the profile groups differed on the Composite Health Indicator (CHI) ($F = 25.52$, $p = 0.00$) (**Figure 4**) and on the Happiness Index (HI) ($F = 18.76$, $p = 0.00$).

Post-hoc group comparisons using Bonferroni range correction showed that profiles with high Self-Directedness are significantly different from those with low Self-Directedness (**Table 7**). For both non-affective and affective well-being, higher Self-Directedness was strongly associated with higher well-being regardless of the other two character traits. In our study, Cooperativeness and Self-Transcendence were not associated with non-affective or affective well-being, with exception of Creative (SCT) and Organized (SCt) profiles in terms of Composite Health Indicator (HI) and positive affect.

THE INFLUENCE OF CHARACTER PROFILES ON EXTREMES OF NON-AFFECTIVE WELL-BEING

The profile groups differed significantly in the proportion that had extremely "good health" ($\chi^2 = 103.61$, $df = 7$, $p = 0.00$) and extremely "poor health" ($\chi^2 = 62.97$, $df = 7$, $p = 0.00$). The

FIGURE 1 | Standardized values (mean = 0, *SD* = 1) of positive affect in different character combinations. SCT, creative; SCt, Organized; ScT, Fanatical; Sct, Autocratic; sCT, Moody; sCt, Dependent; scT, Disorganized; sct, Depressive; ANOVA: *F* = 15.89, *p* = 0.00.
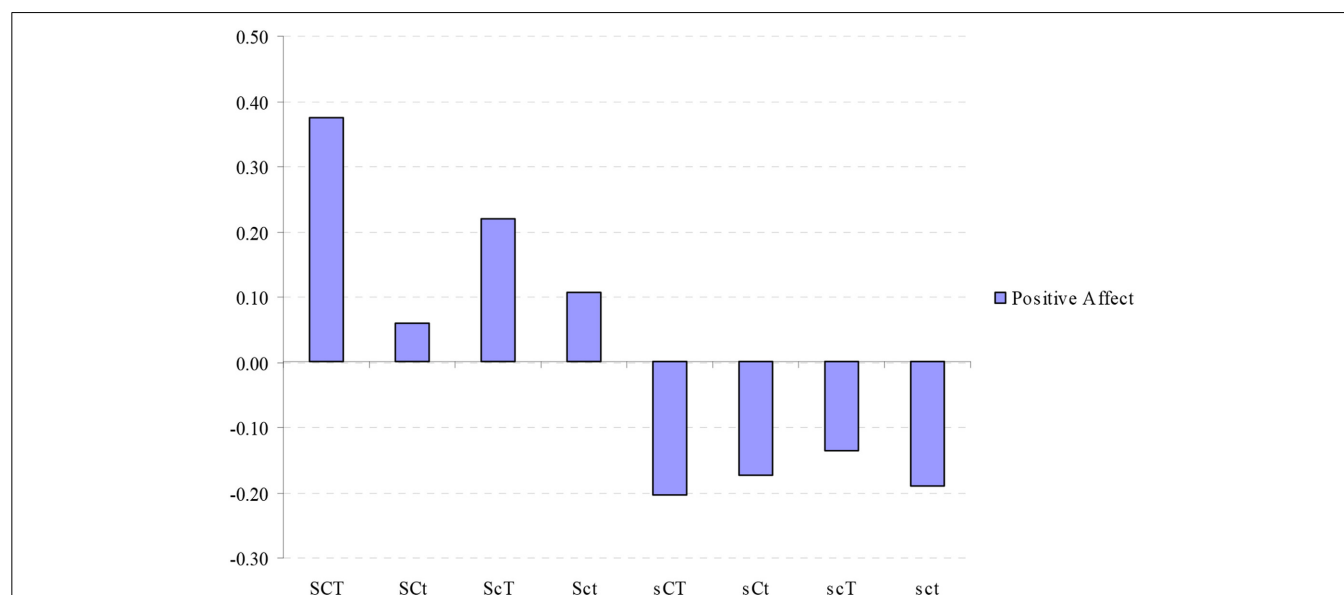
FIGURE 2 | Standardized values (mean = 0, SD = 1) of negative affect in different character combinations. SCT, creative; SCt, Organized; ScT, Fanatical; Sct, Autocratic; sCT, Moody; sCt, Dependent; scT, Disorganized; sct, Depressive; ANOVA: $F = 9.84$, $p = 0.00$.
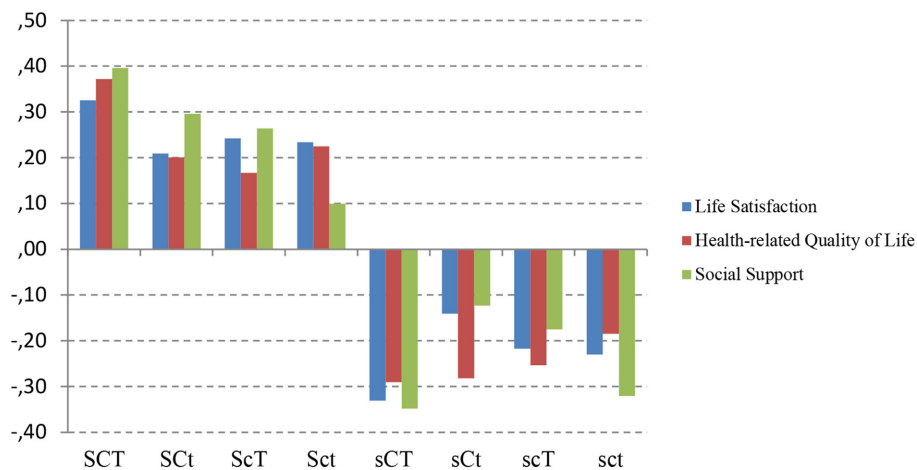
FIGURE 3 | Standardized values (mean = 0, SD = 1) of life satisfaction, health-related quality of life and social support in different character combinations. SCT, creative; SCt, Organized; ScT, Fanatical; Sct, Autocratic; sCT, Moody; sCt, Dependent; scT, Disorganized; sct, Depressive; All three individual ANOVAs are significant at $p < 0.05$.

percentages with best health and worst health are showed in **Figure 5**.

In order to quantify the overall linear influence of the three character variables on happiness and wellness, regression analyses were carried out with the Happiness Index (HI) or Composite Health Index (CHI) as the dependent variable predicted by the three character traits. Self-Directedness and Cooperativeness character traits explained a significantly variance of the non-affective well-being, whereas a significantly variance of the affective well-being was explained by Self-Directedness and Self-Transcendence. Self-Directedness ($\beta = 0.43$, $t = 15.24$, $p = 0.00$) and Cooperativeness ($\beta = -0.07$, $t = -2.42$, $p = 0.02$)

explained 15.5% of the variance in Composite Health Index (CHI) ($R^2 = 0.16$, $F = 140.70$, $p = 0.00$). Self-Directedness ($\beta = 0.32$, $t = 13.24$, $p = 0.00$) and Self-Transcendence ($\beta = -0.07$, $t = -2.86$, $p = 0.00$) explained 11% in Happiness Index (HI) ($R^2 = 0.11$, $F = 89.75$, $p = 0.00$).

DISCUSSION

Multidimensional character profiles are strong predictors of different components of health and of composite wellbeing in adults. In order to describe the influence of character profiles in different components of wellbeing, we estimated the specific contribution of the character traits of self-directedness,

Table 5 | Comparisons between character profiles in standardized measures of well-being, social support and health-related quality of life.

	Life satisfaction		Social support		Health-related quality of life	
	t	p	t	p	t	p
SELF-DIRECTEDNESS						
SCT vs. sCT	6.87	0.00	7.07	0.00	6.32	0.00
SCt vs. sCt	3.79	0.00	3.84	0.00	4.59	0.00
ScT vs. scT	2.85	0.01	3.59	0.00	3.31	0.00
Sct vs. sct	5.01	0.00	4.71	0.00	4.37	0.00
COOPERATIVENESS						
SCT vs. ScT	0.61	0.55	0.99	0.33	1.61	0.11
SCt vs. ScT	−0.32	0.75	0.26	0.80	−0.27	0.79
sCT vs. scT	−1.02	0.31	−1.71	0.09	−0.34	0.73
sCt vs. sct	0.81	0.42	1.90	0.06	−0.88	0.38
SELF-TRANSCENDENCE						
SCT vs. SCt	1.67	0.10	1.14	0.25	5.36	0.04
ScT vs. Sct	0.044	0.97	1.27	0.21	−0.43	0.67
sCT vs. sCt	−1.49	0.14	−1.78	0.08	−0.07	0.95
scT vs. sct	0.19	0.90	1.80	0.07	−0.80	0.43

SCT, creative; SCt, Organized; ScT, Fanatical; Sct, Autocratic; sCT, Moody; sCt, Dependent; scT, Disorganized; sct, Depressive.

Table 6 | Descriptive statistics for standardized Composite Health Index (CHI), Happiness Index (HI) and positive and negative affects by character profile.

	CHI		HI		Positive affect		Negative affect	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE
SCT	0.36	0.05	0.35	0.06	0.38	0.06	−0.22	0.06
SCt	0.24	0.04	0.27	0.05	0.06	0.05	−0.33	0.05
ScT	0.22	0.10	0.27	0.11	0.22	0.10	−0.21	0.12
Sct	0.19	0.05	0.23	0.07	0.11	0.07	−0.24	0.08
sCT	−0.32	0.07	−0.39	0.09	−0.20	0.08	0.39	0.09
sCt	−0.18	0.08	−0.22	0.10	−0.17	0.10	0.18	0.09
scT	−0.22	0.05	−0.26	0.07	−0.14	0.07	0.26	0.08
sct	−0.25	0.04	−0.22	0.06	−0.19	0.06	0.17	0.06

SCT, creative; SCt, Organized; ScT, Fanatical; Sct, Autocratic; sCT, Moody; sCt, Dependent; scT, Disorganized; sct, Depressive.

cooperativeness and self-transcendence on different aspects of wellbeing (satisfaction with social support, quality of life, life satisfaction and affect). Our results revealed that character profiles have a significant influence on different dimensions of wellbeing, confirming the tendencies found in previous studies (Cloninger and Zohar, 2011; Josefsson et al., 2011).

VARIANCE ON WELLBEING MEASURES

Our results confirm that well-being consists of several components of correlated factors. Perceptions of health-related quality of life, social support, life satisfaction and affect are correlated dimensions which need to be taken as whole, in order to achieve a complete understanding of the biopsychological functioning (Cloninger, 2004). Therefore, we estimated two composite indicators: the Composite Health Indicator (CHI, which is the mean of non-affective measures of wellbeing: satisfaction of social support, health-related quality of life and satisfaction with life) and the Happiness Indicator (HI, the score of positive affect minus the score of negative affect). As expected, the composite indicators had a higher variance than individual scales in our study, similarly to what happened with the Israeli and the Finn adults studies (Cloninger and Zohar, 2011; Josefsson et al., 2011). For example, both in the Israeli (CHI = 48.19; Life satisfaction = 41.08; Health quality of life = 24.8 and Social Support = 14.61) and in the Finn (CHI = 74.33; Life satisfaction = 41.73; Health related quality of life = 25.36; Social Support = 60.24) studies, where the CHI variance was superior of the variance of each one of the individual components. In our sample of adolescents, however, the variance of all the wellbeing indicators (both composite and individual indicators) was smaller than in the studies with adults. This was an expected result, as the values of the composite and the values of the individual variables may differ in how they spread out around the mean and around each other. This may suggest that between adolescents the variance on these indicators in smaller than in adults, which may help to understand the specificities found in our sample of adolescents concerning Cooperativeness and Self-Transcendence, and supports the idea that amongst adolescents these processes are not still as mature and differentiated than as they in adults, reason why the variance was smaller in Portuguese adolescents. Additionally, because the range of ages in the adolescents sample (from 12 to 18, mostly and some from 18 to 21) is smaller than in the population representative samples of Israel (24 from 39) and Finland (up 40 years old), and it refers to life stages with substantive qualitative differences, the participants from the adults populations samples were necessarily exposed to different and more heterogenic experiences and contextual influences than adolescents, which may contribute to the less variance on the processes that are expected to co-variate as a function of contextual and experiences heterogeneity.

WELL-BEING BY AGE AND CURRICULUM TYPE

Mean differences between Middle school and High school adolescents revealed statistically significant differences on all dimensions of personality (with exception of Harm Avoidance), and in all indicators of wellbeing (with exception of the Happiness Index). Generally, younger students had higher scores on TCI dimensions of Novelty Seeking and of Self-Transcendence, and higher scores on all the indicators of wellbeing. Exceptions to this tendency were the Happiness Index (no differences) and the Satisfaction with social support (higher scores on older adolescents). Although these results are in line with previous findings on the developmental trends of both TCI dimensions and on Wellbeing indicators, the effect sizes were small for all the significant differences. Concerning curriculum type, statistically significant differences were also found for all the TCI dimensions (with exception of Self-Transcendence) with adolescents enrolled in regular schools presenting lower levels of Novelty Seeking and

FIGURE 4 | Standardized values (mean = 0, *SD* = 1) of Composite Health Index in different character combinations. SCT, creative; SCt, Organized; ScT, Fanatical; Sct, Autocratic; sCT, Moody; sCt, Dependent; scT, Disorganized; sct, Depressive; ANOVA: *F* = 25.53, *p* = 0.00.
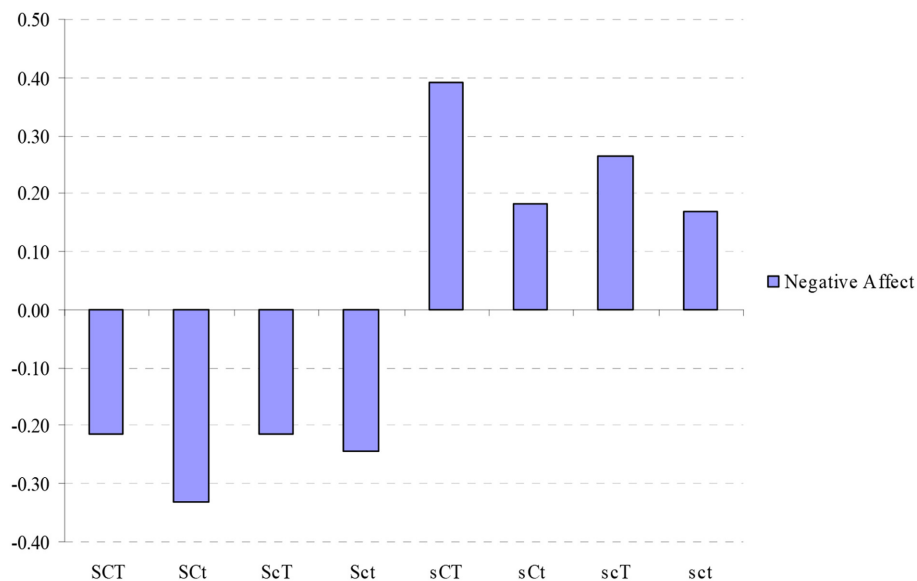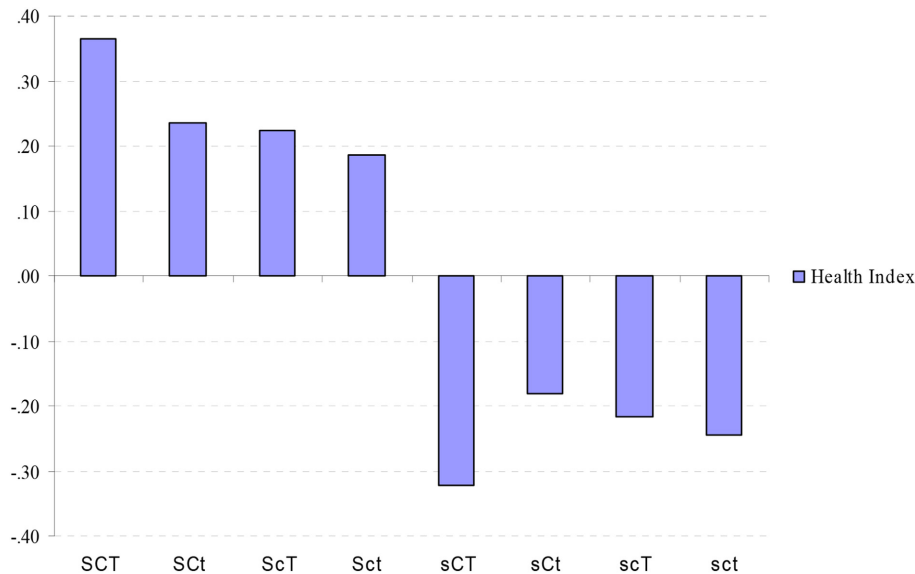
Table 7 | Comparisons between character profiles in standardized measures of Happiness Index (HI), Composite Health Index (CHI), and negative and positive affect.

	HI		CHI		Negative affect		Positive affect	
	t	*p*	*T*	*p*	*t*	*p*	*t*	*P*
SELF-DIRECTEDNESS								
SCT vs. sCT	7.26	0.00	8.22	0.00	−6.07	0.00	5.65	0.00
SCt vs. sCt	4.99	0.00	5.10	0.00	−5.49	0.00	2.28	0.02
ScT vs. scT	4.04	0.00	4.18	0.00	−3.35	0.00	2.72	0.01
Sct vs. sct	4.64	0.00	5.88	0.00	−4.25	0.00	2.95	0.00
COOPERATIVENESS								
SCT vs. ScT	0.70	0.49	1.34	0.18	−0.01	0.99	1.26	0.21
SCt vs. ScT	0.43	0.66	0.117	0.91	−1.02	0.31	−0.51	0.61
sCT vs. scT	−1.15	0.25	−1.27	0.21	1.10	0.27	−0.62	0.54
sCt vs. sct	−0.01	0.99	0.73	0.47	0.12	0.90	0.14	0.89
SELF-TRANSCENDENCE								
SCT vs. SCt	1.13	0.26	1.99	0.05	1.56	0.12	3.83	0.00
ScT vs. Sct	0.32	0.75	0.37	0.71	0.22	0.83	0.90	0.37
sCT vs. sCt	−1.27	0.21	−1.35	0.18	1.61	0.11	−0.24	0.81
scT vs. sct	−0.42	0.68	0.44	0.67	1.01	0.31	0.57	0.57

SCT, creative; SCt, Organized; ScT, Fanatical; Sct, Autocratic; sCT, Moody; sCt, Dependent; scT, Disorganized; sct, Depressive.

of Harm Avoidance, but higher values of Reward Dependence, Persistence, Self-Directedness and Cooperativeness. Also, students enrolled in Regular students registered higher levels of wellbeing than their colleagues from Vocational school. For example, adolescents from vocational school registered lower levels of Positive affect and higher levels of negative affect. These results are in line with the expected, as in Portugal typically students in vocational schools registered a relatively poor academic trajectory in regular schools, reason why most of them moved from regular to vocational schools. Again, these statistically significant differences were small, as suggested by the Effect size, and therefore, they need to be considered with caution.

INFLUENCES OF PERSONALITY ON WELLBEING
As found in studies with adults, in Portuguese adolescents each character trait had a unique contribution to the different dimensions of wellbeing. Self-directedness was significant predictor of life satisfaction, health-related quality of life, perceived social support and positive and negative affect. Cooperativeness and Self-transcendence did not predict positive neither negative affect, but Self-Transcendence was associated with higher positive affect, when associated with high values of Self-Directedness and Cooperativeness. Cooperativeness and Self-Transcendence had little or no linear association with any measure of non-affective well-being.

In Portuguese adolescents, Self-directedness alone explained 15.2% of the variance of non-affective well-being and 9.9% of the variance of the affective well-being. When we used only Cooperativeness to predict well-being, it explained 2.7% of the variance in non-affective well-being and 1.6% of the affective well-being. Self-transcendence had a negligible impact on well-being in linear regression analysis. These results are in line with those found in previous studies with adults. In the Israeli study, Self-directedness alone explained 32% in non-affective well-being and 45% in affective well-being (Cloninger and Zohar, 2011). Cooperativeness explained 4% of the variance of non-affective well-being. In the Finn study, Self-directedness explained 30% of the variance of non-affective well-being and 40% of the variance of affective well-being; Cooperativeness explained 14% in non-affective well-being and 24% in affective well-being (Josefsson et al., 2011). Self-directedness explained higher percentage of non-affective and affective well-being in adults than in Portuguese adolescents. Cooperativeness explained
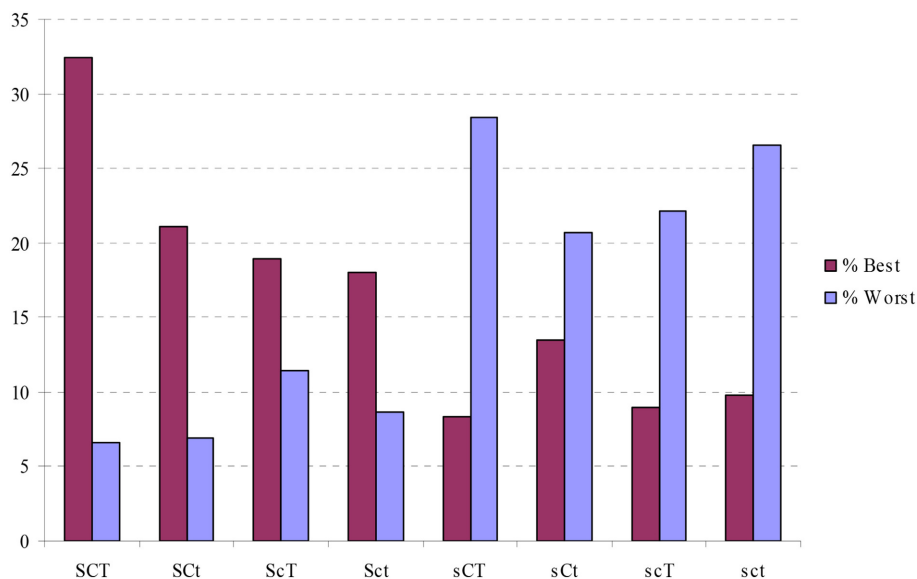
FIGURE 5 | Percentage of people in each character profile who have "best health" or "worst ill-health." SCT, creative; SCt, Organized; ScT, Fanatical; Sct, Autocratic; sCT, Moody; sCt, Dependent; scT, Disorganized; sct, Depressive.

similar percentages of non-affective well-being in Portuguese adolescents (2.7%) and on Israeli adults (4%), but explained a significantly higher percentage in Finn adults (14%), suggesting that Cooperativeness in less important in predicting well-being in Portuguese adolescents and in Israeli adults. Besides, it suggests that the impact of Cooperativeness in predicting well-being depends on both cultural and developmental factors. Self-transcendence had a negligible effect on well-being in linear regression analysis in the previous studies with adults (Cloninger and Zohar, 2011; Josefsson et al., 2011) and with adolescents (Garcia, 2011; Garcia and Moradi, 2011). Character dimensions of Self-directedness and Cooperativeness explained 15.5% of the variance in non-affective well-being in Portuguese adolescents and Self-Directedness and Self-Transcendence explained 10.6% in affective well-being. In the Israeli study, character dimensions explained 36% of the variance in non-affective well-being and 45% in affective well-being (Cloninger and Zohar, 2011). In the Finn study TCI character dimensions taken together explained 56% of the variance of non-affective well-being and 65% in affective well-being (Josefsson et al., 2011).

Self-directedness was strongly associated with all aspects of well-being, even when interacting with the other character dimensions. In fact, the shift between the valence of the different indicators taken separately (positive affect, negative affect, satisfaction with life, health-related quality of life, satisfaction with social support, and from predominant good health to ill health), happened between autocratic (Sct) and moody (sCT) profiles. Self-directedness refers to the person understanding of himself or herself as an autonomous individual, with responsibilities, purposes and resources. The individuals' awareness of his or her responsibilities, purposes and resources regulates people's hopes and desires. Individuals with high Self-directedness are responsible, purposeful, and resourceful and with habits congruent with

long term goals (Cloninger et al., 1993), which influences strongly physical, mental and social well-being (Cloninger and Zohar, 2011; Josefsson et al., 2011). Because of the typical challenges of individualistic and performance oriented societies, adolescents are especially encouraged to develop self-directedness processes. Several outcomes in adolescence (including academic achievement) are strongly predicted by aspects of Self-directedness (such as self-discipline) (Duckworth and Seligman, 2005), and of Persistence (Moreira et al., 2012b), more than by Intelligence Quotient (IQ). Consequently, society (including family and school) tend to emphasize more the development of the processes involved in self-directedness, because of its important to objective outcomes in present and future life (such as academic achievement, occupational outcomes,) rather than aspects of Cooperativeness or Self-transcendence. Additionally, studies conducted by Garcia and colleagues showed that self-directedness mediates the influence of persistence on adolescents' positive affect (Garcia et al., 2012), emphasizing the importance of self-directedness in modulating the expression of dispositional tendencies in adaptive functioning. Self-directed adolescents tend to have good habits and regulate their behaviors accordingly to their long-term goals, which tend to result in long-term achievements, in positive rewards and in positive evaluations of several aspects of individuals' lives, and therefore to well-being.

Cooperativeness was found to explain a variance of well-being similar to what happened in Israeli adults, but less than in Finn adults. Also in adults, Cooperativeness was associated with the perception of social support, increased non-affective well-being and to reduced negative emotions (Cloninger and Zohar, 2011; Josefsson et al., 2011). However, in Portuguese adolescents, those results were not found. Cooperativeness refers to the individuals' awareness of being part of a society. Individuals high cooperative are empathic, helpful and social tolerant (Cloninger et al.,

1993). Because of this, the importance of cooperativeness in the satisfaction of social support is associated to the role cooperativeness plays in being well succeeded in having social support. In childhood and adolescence, social support is highly dependent of the surrounding and established social networks (such as family, school, etc.). Being social support associated to the satisfaction of the individuals' needs, western societies are organized so adults guarantee the satisfaction of child and adolescents basic needs in a collective responsibility perspective. Societies are organized in a way by which several factors are present, regardless of the child and adolescents characteristics (a child or an adolescent should have the need support at home, school, etc., regardless of being more or less cooperative). As the individual grows, he or she becomes more autonomous, which tend to mean that the individual is more dependent of his or her characteristics to be well succeed in adaptation. Therefore, more cooperative individuals are more likely to be more effective in creating, feeding and mobilizing social networks, which increases the probability of having his or her needs satisfied and of perceiving the social support as satisfactory.

Self-transcendence was found to have a negligible linear association with well-being in Portuguese adolescents, but when in interaction with Self-directedness it predicted 10.4% of the variance of affective well-being. Although less than in Israeli adults, the non-linear influence of Self-transcendence in well-being was similar to what was found in Finn adults. Self-transcendence refers to the awareness of being part of a whole, where all things, people and animals are connected (Cloninger et al., 1993). Abstractedness significantly increases during adolescence, allowing individuals for developing a growing awareness of self-transcendent aspects. Although self-transcendence aspects are involved in adolescents' mapping of the existence, they are typically more centered in their concrete aspects of experience (self-image, peer relations, etc.). As a consequence, concrete aspects of existence are more salient in adolescents' experiences than more abstract and transcendent aspects. Therefore, it is understandable that adolescents' evaluations of the several aspects of life be more dependent of more concrete and immediate factors, rather than of transcendent aspects, meaning that self-transcendence play a more distal influence on adolescents' wellbeing, with self-directedness aspects playing a more proximal influence on adolescents' wellbeing. Besides, self-transcendence and abstractedness become more differentiated in late adolescence and early adulthood. The mean age of the participants on our studies was about 15 years old, an age where it is expected that a significant maturation and differentiation of self-transcendence is still to occur. Therefore, self-transcendent aspects may have a more distal impact on adolescents' wellbeing, when compared with self-directedness. Previous studies with adults revealed that, when the interactions among character traits are taken into account, Self-transcendence had a consistent impact on the presence of both positive and negative emotions (Cloninger and Zohar, 2011; Josefsson et al., 2011). Also in adolescents, when the other two character traits were held constant, Self-transcendence increased non-affective well-being and both positive and negative affect. In spite of the cultural differences found in the studies of Israel and Finland, and of the differences between our study with adolescents and the two adult studies, the three studies assessing

the non-linear associations between well-being and multidimensional character profiles registered similar tendencies.

Altogether, these results suggest that Self-directedness is a significant predictor of well-being, regardless of the culture and age, and that cooperativeness and self-transcendence influences on well-being depends on cultural, religious and developmental factors. In fact, In the Finn data all associations of Cooperativeness with happiness, composite health or affect were significant (Josefsson et al., 2011), but no such associations were observed in the Israeli study (Cloninger and Zohar, 2011), suggesting that Cooperativeness may be a more important predictor of affective and non-affective well-being in Finland than in Israel (Josefsson et al., 2011). Similarly, our results suggest that Cooperativeness and Self-transcendence may be less important in predicting affective and non-affective well-being in adolescents than in adults. In spite of this, and because cultural differences were found in Finland and Israel, cross-cultural studies exploring the associations between the multidimensional profiles of Character are needed in order to confirm the trends found in Portuguese adolescents. Configurations of personality dimensions allow for the multidimensional nature of adaptive human functioning (Cloninger and Zohar, 2011), and are more compatible to the interdependence of the different components of heath. Similarly, well-being is a multicomponent phenomenon, also because it depends on the dynamics between the different individuals functioning domains involved in adaptation. As found in previous studies, this study reveals that well-being depends on specific interactive and non-linear dynamics of personality development (Cloninger and Zohar, 2011), and that each dimension of well-being must be considered as an interdependent domain involved in the individuals' adaptive functioning (Cloninger, 2009).

This was the first study replicating in adolescents the two national-based studies which assessed the non-linear interactions between character dimensions in the explanation of well-being in Israeli and Finn adults (Cloninger and Zohar, 2011; Josefsson et al., 2011). Our results clearly confirm that configurations of the three dimensions of character measured by the Temperament and Character Inventories (both the adolescent and adult versions) influence affective and non-affective well-being also in adolescents. The person-centered approach used in this study is more consistent with the holistic and dynamic nature of human beings, allowing for an understanding of human development within an individual. Also, results from this study confirm the importance a non-linear approach to the relation between personality and well-being, as the non-linear impact of Cooperativeness and Self-transcendence on different aspects of wellbeing would not be captured with linear regression analysis only.

Implications

Adolescence is a developmental period characterized by marked changes in adolescents in cognition, emotion, behavioral and contexts. These changes result from the process of maturation and differentiation of neuropsychological systems, including the behavioral activation, the inhibition, the reward dependence systems and the higher order cognitive self-regulatory processes. These specific neuroanatomical and functional systems change over time, with emotional and cognitive dimensions presenting distinct patterns of development over the lifespan (Josefsson

et al., 2013a). Adolescence is characterized by higher sensitivity to novelty, exploration and to reward, and lower inhibitory control (Eldreth et al., 2013). Adolescents' behaviors result from the interaction between the changing/maturating neuroanatomic circuitries and processes and contextual influences (Josefsson et al., 2013b). The unbalance between the different systems, and depending on the dynamics between neuropsychological systems and context characteristics (specifically the failure of higher order regulatory processes in modulating the adaptive expression of the emotional responses and behaviors) place adolescents at increased risk for poor functioning and for maladaptive developmental trajectories, including risk behaviors and emotional lability. These patterns of functioning are significant components of developmental cascades, which are strong predictors of functioning also during adulthood (Eldreth et al., 2013). Conversely, an adaptive maturation of higher order cognitive processes is a strong predictor of healthy personality development and of healthy functioning, including less psychopathology and more agentic motivation (Moreira et al., 2014a). Additionally, different higher order cognitive processes (self-directedness, cooperativeness and self-transcendence) are involved in the individuals' psychobiological organizations underlying behavior. Our results confirm that also in adolescents different combinations of character dimensions are strong predictors of both negative and positive functioning, with elevation in the three dimensions being associated with healthy functioning, similar to what was found with adults (Cloninger and Zohar, 2011; Josefsson et al., 2011).

Because adaptive functioning results from the dynamics of developmental cascades, and because positive aspects are crucial for healthy developmental trajectories, the understanding of the developmental associations between personality and well-being is highly relevant for the promotion of youth positive developmental trajectories promotion.

Almost half of the European adolescents report multiple health complaints, poor to fair health, low life satisfaction or a combination of these (Ravens-Sieberer et al., 2009). Because of the associations of well-being with adaptive and maladaptive functioning, these results suggest that besides the promotion of educational persistence and motivational dimensions (Walker et al., 2006; Moreira et al., 2013), the promotion of well-being needs to be established as an educational priority, as it is an avenue for the promotion of a healthy psychobiological adaptation to experience. On the one hand, although life circumstances also influence long-term levels of well-being, personality explains a significant portion of the variance of well-being (Diener et al., 2003; Suldo and Shaffer, 2008). Several aspects of positive mental health operationalized by Vaillant (2012) refers to and are well predicted by Cloninger' character dimensions of Self-directedness, Cooperativeness and Self-Transcendence. Therefore, schools need to accept their responsibility in promoting adaptive trajectories promotion (rather than focus on the moment, on deficits or in grades), which requires the promotion of healthy personality development. In fact, as highlighted by Heldon and Lybormirsky, sustainable happiness is possible through intentional activity changes, more so than through circumstantial changes (Heldon and Lybomirsky, 2006; Blustein, 2008; Hosie and Sevastos, 2010). This fact justifies systematized, internationalized and continued school-based approaches to the promotion of mental health, including well-being (Cloninger et al., 2010; Moreira et al., 2014b). On the other hand, there is a robust body of evidences about the efficacy of school-based strategies for the promotion of higher cognitive self-regulatory functions. These strategies are been called by several names, including social and emotional skills, emotional intelligence or socio-emotional learning (Moreira et al., 2012a). Programmes for the promotion of these dimensions are efficient in promoting social and emotional skills, positive attitudes and behaviors (Kimber et al., 2008; Moreira et al., 2010), including positve academic trajectories (Durlak et al., 2011).

Schools are a privileged avenue for the promotion of youth positive development. In order to be effective in promoting youth positive development, schools need to incorporate in their objectives and practice the promotion of a healthy personality development.

Limitations

This study has some limitations. The instruments used in this Portuguese adolescents study, although age-appropriate, are not exactly the same used in both previous studies in Israel and Finland. Another limitation is that this study used a cross-sectional sample, which prevents us of establishing causal relations. However, the associations between multidimensional profiles of character and well-being were replicated in three samples (two adult samples and one adolescent sample), which suggest that these trends are consistent. Future studies that replicate this study in other cultures are needed, in order to test the associations between configurations of character dimensions and well-being in adolescents from different cultures.

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The character strengths of class clowns

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Class clowns traditionally were studied as a type concept and identified via sociometric procedures. In the present study a variable-centered approach was favored and class clown behaviors were studied in the context of character strengths, orientations to happiness and satisfaction with life. A sample of 672 Swiss children and adolescents filled in an 18 item self-report instrument depicting class clown behaviors. A hierarchical model of class clown behaviors was developed distinguishing a general factor and the four positively correlated dimensions of "identified as a class clown," "comic talent," "disruptive rule-breaker," and "subversive joker." Analysis of the general factor showed that class clowns were primarily male, and tended to be seen as class clowns by the teacher. Analyses of the 24 character strengths of the VIA-Youth (Park and Peterson, 2006) showed that class clowns were high in humor and leadership, and low in strengths like prudence, self-regulation, modesty, honesty, fairness, perseverance, and love of learning. An inspection of signature strengths revealed that 75% of class clowns had humor as a signature strength. Furthermore, class clown behaviors were generally shown by students indulging in a life of pleasure, but low life of engagement. The four dimensions yielded different character strengths profiles. While all dimensions of class clowns behaviors were low in temperance strengths, the factors "identified as the class clown" and "comic talent" were correlated with leadership strengths and the two negative factors ("disruptive rule-breaker," "subversive joker") were low in other directed strengths. The disruptive rule breaking class clown was additionally low in intellectual strengths. While humor predicted life satisfaction, class clowning tended to go along with diminished satisfaction with life. It is concluded that different types of class clowns need to be kept apart and need different attention by teachers.

Keywords: class clown, character strengths, VIA-Youth, signature strengths, life satisfaction, positive psychology

INTRODUCTION

Most classrooms have a few students who joke a lot and who make others in the room laugh. These are commonly called "class clowns." Students that take on this role may disrupt class with their jokes and wisecracks, may make silly noises or pull weird faces, bump into imaginary walls, copy the teacher behind their back, and may make wild comments that gets the whole class laughing uproariously. As other students may start imitating their behavior, this may get a class out of control and thus, the class clown may constitute a disciplinary problem for a teacher (Reed, 1989), even if it does not compare to more serious disciplinary problems (such as sexual or racial harassment, stealing or using abusive language).

Almost 40 years have elapsed since the classic study on class clowns by Damico and Purkey (1976, 1978) that first shed some light onto this common but overlooked phenomenon. Their study involved 96 class clowns (derived from a sample of 3500 eighth graders), mostly males (80 out of 96), that were compared to a randomly selected sample of 237 pupils. Analyses of teacher perceptions of students yielded that class clowns were significantly higher than non-clowns on asserting behaviors (i.e., speaking up and actively participating in class), attention

seeking, unruliness, leadership, and cheerfulness, but lower in "accomplishing." Class clowns themselves reported less positive attitudes toward the school authorities (i.e., teacher and principal) but there was no difference in their attitude toward classmates, the school in general, and the self. Finally, class clowns saw themselves as leaders and as being vocal in expressing ideas and opinions in front of their classmates. Damico and Purkey (1978) concluded that ". . . [a]dolescent clowns were found to have many behaviors and personal assessments in common with adult wits. They are male, leaders, popular, active, independent, creative, and have positive self-perceptions. Among adults, groups containing wits were found to possess higher morale, be more task-oriented, and better at solving problems than groups without wits (Smith and Goodchilds, 1959, 1963). Given the similarity between adolescent clowns and adult wits in other areas, it is safe to assume that clowns might make similar contributions to groups within schools" (p. 397).

These pioneering results were neither replicated nor refined or expanded—perhaps ". . . because of the difficulty of finding enough class clowns to make a meaningful analysis" (p. 186; Priest and Swain, 2002). Before continuing with this research it seem of interest to make a few adjustments. The first issue relates to the

opposition of *the class clown as a type vs. class clowning behavior*. We propose that next to the person-centered type approach (i.e., identifying who is a class clown and who is not) a variable-centered approach (i.e., describing the behaviors that class clowns exhibit and study their dimensionality) should be pursued. The "type" approach suffers from several limitations. "Class clowns" (like the wit, or "organizational fool," Kets de Vries, 1990) is a lay-concept, referring to an informal role (not a profession or a vocational entity like a circus or hospital clown) but this is not a scientific concept. As a type noun it emerged from everyday conversations about pupils and entered scientific discourse without further scrutiny. In the history of personality research types often disappeared once measurement started as one often found that there are no pure types (but gradual differences within the proposed types) and the behaviors associated to types turned out to be multidimensional. Then, the upper end of the dimension may be considered a "type" (i.e., the people above a cut-off value). Thus, for the present study descriptions of class clown behaviors were collected from the literature and entered in a list to be examined (Platt, 2012).

The second issue relates to methodology, namely the question of *use of sociometry vs. use of questionnaires*. We want to propose that next to the sociometric identification of class clowns (by teachers, classmates), also questionnaires (self-reports, peer-, and teacher-reports) are used to assess gradual differences among students on one global dimension (or several separate dimensions) of class clown behaviors. In the former case the number of nominations received matters, in the latter the quantification comes from the number of items that apply (i.e., the number of class clown behaviors that someone engages in). In both cases there is a variation and cut-off scores are used to eventually make a dichotomous judgment (i.e., class clown, no class clown). In the study by Damico and Purkey (1978) only those students that received 10 or more nominations by their peers were considered a class clown and those with more than 25 nominations were "super class clowns" (and assumed to be attention seekers). When the participants are asked (Priest and Swain, 2002) whether they consider themselves to be the class clowns the scores are already binary and need no further treatment. A questionnaire approach has not been pursued so far and it needs to accommodate several observations found from sociometric studies (using teachers and peers). For example, class clowns appear to be a minority in a class; most students are not class clowns and thus skewed distributions might be expected. The number of class clowns in the sample varied in previous studies and may be as low as 3% (Damico and Purkey, 1978) and as high as 21% (Priest and Swain, 2002). This is setting a benchmark against which the cut-off points will be tested.

The third issue relates to the search of characteristics of class clowns: *School behavior or general character strength?* We propose that not only classroom behaviors are used to predict who is nominated as a class clown, but also more general characteristics of a student, such as his or her character could be used to predict dimensions of class clown behaviors. The inclusion of the model of character strengths allows describing class clowns more specifically but also more comprehensively. In their model of the good character Peterson and Seligman (2004) first

discovered six virtues to be found in many virtue catalogs across the globe and covering the last two millennia, namely wisdom and knowledge, courage, humanity, justice, temperance, and transcendence. In the next step they identified 24 character strengths (i.e., processes and mechanisms that lead to the virtues), namely appreciation of beauty, bravery, creativity, curiosity, fairness, forgiveness, gratitude, honesty, hope, humor, kindness, leadership, love, love of learning, modesty, open-mindedness, perseverance, perspective, prudence, religiousness, self-regulation, social intelligence, teamwork, and zest. These strengths are considered to be distinguishable routes to displaying one or more of the virtues. Furthermore, Peterson and Seligman (2004) postulate the existence of "signature" strengths, i.e., the strength that a person "... owns, celebrates, and frequently exercises" (p. 18). While strengths generally are defined to contribute to various fulfillments that constitute the good life, for the self and for others it is the signature strengths that are most fulfilling for a given individual. In fact the application of individual signature strengths were demonstrated to be related to positive life outcomes such as higher happiness and meaning and lower levels of depression (e.g., Seligman et al., 2005; Littman-Ovadia and Steger, 2010; Harzer and Ruch, 2012; Gander et al., 2013).

There are several reasons to study of dimensions of class clown behavior within a framework of the good character. First, despite the fact that class clowning has occasionally be seen as a disciplinary problem, class clowns will possess certain strengths. The study of Damico and Purkey (1978) found higher scores for the class clown not only for leadership but also for "cheerfulness"— this might be an indirect effect of the class clowns' comic talent, and suggests that the strength of humor might characterize class clowns, or even may be their signature strength. Second, the display of more destructive class clown behavior might be related to underdeveloped strengths thereby showing where interventions might be fruitful. It should be reminded that one of the criteria for character strengths is that a strength by one person does not diminish other people in the vicinity. Class clowning behaviors might be detrimental to others as teachers or students can be the target of a prank. Likewise, if strengths that keep students in flow; i.e., school-related strengths, are underdeveloped it might be that attention wanders off to other things and need for fun kicks in and students start entertaining themselves and others. Thus, strengths aimed at fostering healthy communities and at the acquisition of knowledge might be less developed. Third, strengths should be in balance and the combination of strengths might be a fruitful venue of study. Even if humor is a signature strength of a person, he or she will not necessarily engage in class clowning, for example if humor is balanced out by strengths of temperance. Finally, the use of the VIA-Youth not only allows studying the 24 individual strengths but also the five strength factors that have repeatedly been found, namely *leadership strengths* (i.e., leadership, humor, perspective, social intelligence, and bravery), *temperance strengths* (i.e., prudence, self-regulation, perseverance, open-mindedness, and honesty), *intellectual strengths* (i.e., curiosity, love of learning, beauty, and creativity), *transcendence strengths* (i.e., religiousness, zest, gratitude, love, and hope), and *other-directed strengths* (i.e., modesty, forgiveness, kindness, fairness, and teamwork). The simultaneous study of all

24 individual strengths and the five strengths factors will allow drawing a more differentiated picture of the strengths (or lack of strengths) of class clowns beyond the domains where hypotheses exist.

The present study aims at (a) a set of items that may be used to measure the level of involvement in class clown behavior that is higher for the group of identified class clowns and lower for non-class clowns. Next, (b) the study aims at investigating whether different dimensions of class clown behaviors can be distinguished. Furthermore, (c) the character strengths of class clowns will be examined (both for the global class clown dimension as well as the dimensions identified). Finally, (d) the relationship with orientations to happiness and global life satisfaction will be examined. Generally humor is a predictor of life satisfaction among adolescents ($r = 0.32$ in Ruch et al., 2014). However, a low fit of humor as signature strengths to classroom discipline might lead to frustration and diminished happiness with school, and eventually with life in general. There are different types of well-being. Peterson et al. (2005) distinguished among pleasure, engagement, and meaning, and while class clown pranks are conducive to pleasure they will be antagonistic to engagement.

Some hypotheses can be put forward. In class pupils have to suppress the need to act or say something unless it is their turn. This will also be the case for class clown behaviors, which often are not appropriate or wise to perform. Hence Hypothesis 1 states that class clown behaviors will correlate negatively with temperance strengths (e.g., prudence, self-regulation, endurance). Class clown behaviors will be shown for entertainment and fun and are meant to amuse. Hence Hypothesis 2 predicts that the life of pleasure, as well as humor will go along with class clown behavior. Next, based on Damico and Purkey (1978) Hypothesis 3 claims that leadership will be a predictor of class clown behavior, both as an individual strength and the leadership strengths factor (i.e., leadership, humor, perspective, social intelligence, and bravery). Hypothesis 4 states a negative relationship between the factor of other-directed strengths (i.e., modesty, forgiveness, kindness, fairness, and teamwork) and negative class-clown behaviors. Some pranks and class clown behaviors have a target, or a person that is not happy about the clowning. Hence one can postulate that that pronounced interpersonal strengths will make pupils refrain from destructive behaviors. Likewise, it is predicted that being high in strengths related to the acquisition of knowledge (Hypothesis 5) and pursuing a life of engagement (i.e., the tendency to experience flow; Hypothesis 6) will be less inclined to indulge in class clown behavior. Hypothesis 5 will be tested for the factor of intellectual strengths as well as those the individual school-related strengths, identified in prior studies on the basis of correlation with positive school functioning and overall school achievement of pupils, such as love of learning, perseverance, and prudence (Weber and Ruch, 2012; Weber et al., submitted). Furthermore, predictions can be made too regarding the signature strengths: humor may be expected to be a signature strength among class clowns (Hypothesis 7), however, humor as signature strengths may not lead to class clown behavior if prudence is high too (Hypothesis 8). Finally, life satisfaction is expected to correlate negatively with the negative class clowning behaviors (Hypothesis 9).

MATERIALS AND METHODS

PARTICIPANTS

The sample consisted of 672 German-speaking children and adolescents (40.7% boys; two did not indicate gender). Their mean age was 14.87 years ($SD = 3.33$; ranging from 10 to 18 years; 3 missings). Regarding the school type, 28.1% of the participants attended primary school, 29.9% attended secondary school, 19.5% attended a gymnasium/ high school, 10.9% were currently enrolled in an apprenticeship, and 10.7% indicated "other" (e.g., extra school year or gap year), 0.9% of the participants did not indicate their school level. Overall, 87% of the sample were Swiss citizens. Less than 1% of responses to individual items were missing, but df in analyses vary because of this rare missingness. We used listwise deletion to handle missing data in analyses with items, but when computing scales, we computed average values and ignored missing data as long as no more than four items were missing.

INSTRUMENTS

The *Class Clown Behavior Survey* (CCBS; Platt, 2012) is an 18 item self-report instrument assessing a variety of class clown behaviors in a 6-point answer format (1 = *totally disagree*, 2 = *largely disagree*, 3 = *partially disagree*, 4, *partially agree*, 5 = *largely agree*, 6 = *totally agree*). A total score is computed by averaging all items to indicate how strongly students display class clown behavior. Furthermore, two items ("My classmates would call me a class clown." "In my class I am the class clown.") were used in the class clown status index; i.e., to identify class clowns and separate them from non-class clowns. These two items correlated $r = 0.80$ with each other and only if a participant on average agreed to the statements (i.e., scores between 4 and 6) it was identified as a class clown.

Class clown nomination (teachers). Teachers of four classes comprising 80 pupils (46% boys; mean age 15.2 years) were provided lists of pupils and indicated independently from each other whom they considered to be a class clown. The nomination was done 10 month after the students had left the school. The number of nominating teachers varied between 5 and 7 depending on the class. Nine out of 80 students (i.e., 11.25%) were nominated at least once. Thus, there was agreement that 88.75% were not class clowns. No student was nominated by every teacher; the nomination rate was between 14.29 and 83.33%, with a mean of 45.19% (and the number of nominations varied between 1 and 5). This demonstrates that not all teachers see the student alike; either some raise a false alarm or others do not see the class clown behaviors, or the students only behave like a class clown with certain teachers. Some teachers might also be milder in their evaluation. The convergence with being a class clown in the self-rating is significant ($p < 0.05$) but does not exceed 0.35.

The *Values in Action Inventory of Strengths for Youth* (VIA-Youth; Park and Peterson, 2006) adapted to German by Ruch et al. (2014) consists of 198 items for the self-assessment of the 24 character strengths of the VIA classification (Peterson and Seligman, 2004). There are 7–9 items per character strength (about one third of the items are reverse coded) in a 5-point Likert-style format (from 1 = *not like me at all* to 5 = *very much like me*). The VIA-Youth proved to be reliable and valid (e.g., Park and Peterson,

2006; Ruch et al., 2014). The internal consistencies ranged from 0.67 (modesty) to 0.90 (religiousness) and yielded a median of $\alpha = 0.79$ in this study. Factor scores for the factors of leadership, temperance, intellectual, transcendence, and other-directed strengths (cf. Ruch et al., 2014) were derived by a PCA with Oblimin rotation.

The *Orientation to Happiness measure* (OTH; Peterson et al., 2005) is an 18-item self-report questionnaire for the subjective assessment of life of pleasure, engagement, and meaning (six items each). It utilizes a 5-point Likert-scale (1 = *not like me at all* through 5 = *very much like me*). Cronbach alpha was 0.73, 0.71, and 0.77 in the present sample.

The *Students' Life Satisfaction Scale* (SLSS; Huebner, 1991) in a German version by Weber et al. (2013) is a seven-item measure for the self-assessment of global satisfaction with life utilizing a 6-point answer format (from 1 = *strongly disagree* to 6 = *strongly agree*). The SLSS total score is formed by averaging the seven items. Cronbach alpha was 0.85 in the present sample.

PROCEDURE

Data in this study were collected partly in schools (group testing during lessons conducted by instructed teachers), partly at the university (group testing of pupils with two female experimenters) and partly via the internet. All participants attended voluntarily, and all students provided the permission of their parents or legal guardians beforehand in writing or by clicking a control question at the beginning of the online assessment session. All participants firstly filled in the VIA-Youth and then proceeded to the measures assessing the class clown behaviors, satisfaction with life and the orientations to happiness. The sessions lasted around 2–3 h. In the group testing, breaks were initiated by the experimenter/teacher, in the individual sessions, the children and adolescents could take breaks when needed. None of the students was paid for participation. All students received written individualized feedback on their character strengths and additional information on the meaning of each of the character strengths of the VIA classification. The study complies with the requirements from the local research ethics committee basing on the APA standards. The authors confirm that they have reported all data exclusions. The sample size was estimated on the basis of prior studies that allowed to expect on average a 10% prevalence of class clowns.

DATA ANALYSIS

To investigate the CCBS two analyses were performed. First, a principal component analysis was performed on the inter-correlations of the 18 items of the CCBS to see whether all items load on the postulated general factor. Second, a hierarchical factor analysis (see Goldberg, 2006) was employed to see whether there is any meaningful structure to find beyond the first unrotated principal component (FUPC). Hierarchical factor analysis allows seeing how the factors unfold with increasing numbers of extracted factors (cf. Goldberg, 2006). In more detail, the first principal component was extracted and the factor scores were saved. Next, two factors were extracted, rotated according to the Oblimin criterion, and the factor scores were saved. This procedure was repeated for all solutions up to the fifth factor, which

produced factors that did not have enough meaningful markers anymore. Solutions between one and five factors were examined in order to have the possibility to study the relations between factors of different stages of extraction. The factors were interpreted. Then, the factor scores of adjacent factor solutions were correlated with each other, and the salient relations ($r > 0.45$) were represented using arrows. This way, it can be shown how the factors unfold, i.e., how they split up or stay stable from solution to solution. The internal consistencies of the derived subscales of the CCBS questionnaire were estimated by the Cronbach's alpha coefficient. Correlations between strengths and class clown dimensions were controlled for age and gender.

RESULTS

PREVALENCE OF CLASS CLOWNS

Altogether, 85.7% of the participants disagreed to the statement "In my class I am the class clown" ("1 = absolutely disagree": 51.7% "2 = largely disagree": 21.9%, "3 = partly disagree": 12.2%) and 14.3% agreed ("4 = partly agree": 8.0%; "5 = largely agree": 5.6%, "6 = absolutely agree": 0.8%) to it. Thus, the ratings showed that the assignment to be a class clown was not a bimodal variable but continuous. Participants also infrequently indicated that others would think that they were the class clowns ("1": 36.1%, "2": 25.5%, "3": 15.2%, "4": 14.3%, "5": 6.9%, "6": 2.0%). There were 85 who answered affirmatively to both questions (i.e., that they were the class clowns and that others would think that they were a class clown). Using this class clown status index one can state that 12.7% of the participants in the samples considered themselves to be class clowns. Gender played a role ($p < 0.01$), as only 9.3% of the females declared that they were class clowns, but 17.6% of the boys did.

ANALYSES OF THE CLASS CLOWN QUESTIONNAIRES

Cronbach's alpha was very high ($\alpha = 0.92$). The class clown behavior was correlated with the class clown status index. A correlation of this index and the total score of the remaining 16 items yielded a coefficient of 0.66 ($p < 0.001$). Likewise, a *t*-test confirmed that the class clowns ($M = 3.61$; $SD = 0.76$) scored higher than the non-class clowns ($M = 2.43$; $SD = 0.74$), $t_{(665)} = -13.49$, $p < 0.001$, $\eta_p^2 = 0.22$. Thus, those who assign themselves to being a class clown also showed more class clown behavior, validating both measures. Therefore, an average score across all class clown items was computed and used in the subsequent analyses. Furthermore, for a subgroup of 73 students, teacher nominations of class clowns was available and it correlated with 0.35 ($p < 0.05$) with the class clown self-report.

Identification of dimensions of class clown behaviors (or "types"). While the inter-correlations among all items were positive (median = 0.38), the range (0.12 to 0.80) suggested that a structure may be uncovered. Therefore, the inter-correlations among the 18 items were subjected to a principal components analysis. Three eigenvalues exceeded unity (eigenvalues were: 7.70, 1.50, 1.40, 0.91, 0.79, and 0.74) with the first factor alone explaining 42.79% of the variance confirming that a single factor solution is possible. The scree-test suggested the retention of four factors, which explained 63.79% of the variance. Also, the hierarchical factor analysis showed a four-factor solution to
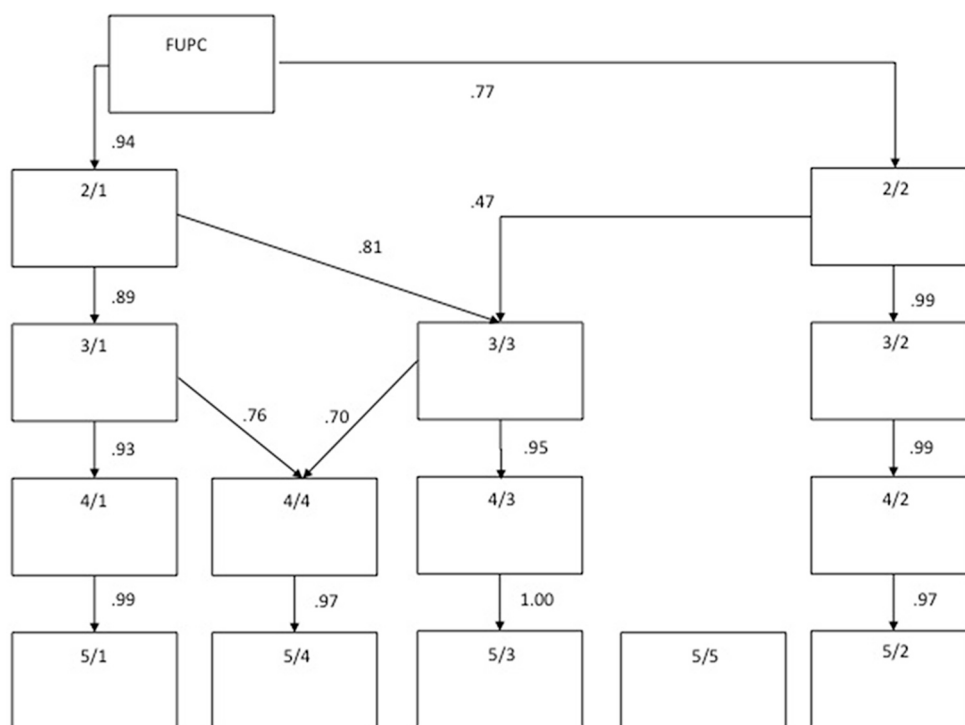
FIGURE 1 | Hierarchical factor analysis of the set of class clown items.

be optimal, as the fifth only yielded two markers[1]. The different solutions between the first unrotated principal component (FUPC) and four Oblimin-rotated factors are displayed in **Table 1**.

Table 1 shows that the first unrotated factor loaded on all items, and the coefficients range from 0.51 to 0.74 (median = 0.65). The highest loadings were by items with a high content saturation ("My classmates would call me a class clown," "My classmates expect from me that I do silly things and make them laugh," "Even when the teacher says my humor is disruptive, most of the time I cannot stop it immediately and need to continue having fun," "During class it does not take long until my humor draws all attention of all my classmates on me"). The scores ranged from 1.00 to 5.56 ($M = 2.54$; Mdn = 2.44; $SD = 0.85$) with the majority of scores between 1 and 3 (i.e., "tend to disagree"). The mode was 2.22 ("disagree") with only few high scorers. Nevertheless, skewness was non-significant ($Sk = 0.51$). There was no bimodality in the distribution of scores and no visible heap of class clowns at the upper end of the distribution. There were 13.1% of the children higher than 3.5 (the scale midpoint) and 5.4% were higher than 4.0 ("tend to agree to the behaviors").

The four-factor structure could be meaningfully interpreted and also the unfolding of the factors is telling (see **Figure 1**). The

first Oblimin rotated factor was loaded by four items and was interpreted as "Identified as the class clown" as the salient loadings refer to having adopted a class clown role in class ($\alpha = 0.87$). In addition to the two items forming the class clown index also the statements "My classmates expect from me that I do silly things and make them laugh" and "During class it does not take long until my humor draws all attention of all my classmates on me" loaded on this factor and made it clear that the high scorer was identified as the class clown. The second factor was loaded by five items and referred to a "Comic talent" ($\alpha = 0.83$). Individuals with high scores described that they are quick with coming up with something funny. The hierarchical analysis showed that this factor was already there at step two and it did not change afterwards. The third factor was loaded by five items and referred to the "Disruptive rule-breaker" ($\alpha = 0.82$). These individuals poke fun at things the teacher says, disregard rules and laugh at them. This factor emerged at step three (breaking away from the prior first one) and stays stable thereafter. The fourth factor ("Subversive joker") referred to individuals that undermine the teachers authority (partly in their absence), competitively play pranks on others and only stop when having had made everyone laugh ($\alpha = 0.80$). The fourth factor emerged at step 4, breaking away from the prior first one and also getting some variables from factor two[2].

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[1]Separate factor analyses were also computed for the individuals indicating to be class clowns (>3.5) and those who don't. For both samples there were clearly 4 factors (Eigenvalues for the class clown group: 5.73, 2.23, 1.62, 1.51, 0.96, and 0.89).

[2]Separate factor analyses were computed for boys and girls and the factor structures turned out to be highly similar. An analysis of the 158 primary schoolers separate from the secondary schoolers yielded a less clear structure for the primary schoolers. Mostly the subversive joker factor is not yet there.

Table 1 | Factor loadings of the 18 class clown items on a first unrotated principal component, and Oblimin rotated 2, 3, and 4 factor solutions.

	FUPC	O2.1	O2.2	O3.1	O3.2	O3.3	O4.1	O4.2	O4.3	O4.4
04. My classmates would call me a class clown	0.73	0.60	0.21	0.79	0.26	−0.12	0.83	0.15	0.07	−0.04
09. In my class I am the class clown	0.72	0.70	0.08	0.84	0.14	−0.07	0.82	0.04	0.08	0.07
05. During class it does not take long until my humor draws all attention of all my classmates on me	0.73	0.55	0.28	0.69	0.32	−0.06	0.66	0.25	0.02	0.07
17. My classmates expect from me that I do silly things and make them laugh	0.74	0.80	−0.02	0.47	−0.01	0.46	0.42	−0.08	0.49	0.19
07. During class it does not take long, until something funny comes into my mind, that I can share with the person next to me	0.59	−0.05	0.84	−0.04	0.79	0.07	−0.03	0.83	0.02	−0.04
02. I quickly can think of funny things, that I could do in class	0.64	0.04	0.78	0.14	0.76	−0.02	0.12	0.79	−0.07	0.02
01. I have funnier ideas and sayings than the teacher	0.60	0.04	0.72	0.08	0.70	0.04	0.10	0.71	0.03	−0.03
10. When the teacher leaves the room, I make fun with the person sitting next to me	0.63	0.12	0.66	−0.09	0.61	0.34	−0.15	0.66	0.21	0.10
13. During class I say funny things to spread good mood	0.71	0.27	0.58	0.28	0.57	0.09	0.21	0.58	0.04	0.11
16. I don't share everything the teachers find important (grades, rules); on the contrary: I occasionally poke fun at them	0.60	0.49	0.17	−0.18	0.11	0.85	−0.09	0.05	0.87	−0.02
18. Some rules in class I find stupid and I laugh at them	0.61	0.50	0.18	−0.12	0.13	0.78	−0.02	0.06	0.83	−0.04
15. Even when the teacher says my humor is disruptive, most of the time I cannot stop it immediately and need to continue having fun	0.74	0.68	0.14	0.20	0.11	0.63	0.18	0.06	0.62	0.14
03. When the teacher says that it is very important, that we learn a lot, I am always the first that does not take that seriously	0.56	0.53	0.08	0.25	0.08	0.39	0.26	0.02	0.43	0.07
12. When the teacher turns away, I invent jokes that I write on paper to show it to my classmates	0.60	0.72	−0.10	0.35	−0.09	0.50	−0.15	0.05	0.05	0.84
11. During the breaks I play pranks on my classmates	0.66	0.78	−0.10	0.45	−0.09	0.46	−0.02	0.02	0.07	0.80
08. Only after have the attention of the entire class I stop joking about	0.51	0.74	−0.25	0.61	−0.21	0.21	0.28	−0.17	0.01	0.57
06. During the breaks my ideas for pranks are cleverer than those of the other kids	0.70	0.61	0.16	0.60	0.19	0.10	0.25	0.27	−0.16	0.57
14. I make the other kids laugh at what the teacher said or did	0.68	0.56	0.20	0.17	0.18	0.53	−0.06	0.23	0.30	0.43
Factor intercorrelations		O2.2		O3.2	O3.3		O4.2	O4.3	O4.4	
	O2.1	0.51	O3.1	0.36	0.45	O4.1	0.37	0.30	0.47	
			O3.2		0.37	O4.2		0.43	0.37	
						O4.3			0.47	

FUPC, first unrotated principal component; O4.1, class clown role; O4.2, comic talent; O4.3, disruptive rule-breaker; O4.4, subversive joker.

Table 1 also shows that the inter-correlation among the factors get gradually lower without containing any further pattern. In fact, a PCA of the four factors yielded a general factor that correlated with the FUPC to the extent of $r = 0.99$. It is noteworthy that the items of factor 1 also had the highest loadings on the FUPC. The second factor was normally distributed, but the others tended to be skewed ($Sk = 0.84 - 0.94$) with most scores at the lower end of the scale.

To examine whether class clowns and non-class clowns only differed in factor 1 but not the others the distinction into class clown and non-class clowns was correlated with the total score (minus the two items that form the index), factor 1 (composed of the remaining 2 items), and the three other class clown scales keeping gender and age constant. The correlations were high and significant, clearly demonstrating the class clowns yield higher scores overall ($r = 0.47$), identified as class clown ($r = 0.55$), the comic talent ($r = 0.39$), the disruptive rule-breaker ($r = 0.36$), and the subversive joker ($r = 0.39$). Thus, the class clowns (as a categorical distinction) are higher in all four dimensions of class clown behavior.

THE STRENGTHS OF CLASS CLOWNS

Next, the first unrotated principal component and the four class clown factors were correlated with demographic variables, the five strengths factors and the 24 individual strengths. As the class clown data were correlated with gender and age, the latter correlations were controlled for age and gender. The results are displayed in **Table 2**.

Table 2 shows that males were higher than females in all clown dimensions except for the second, the "Comic talent," which is not gender specific. The younger participants tended to identify as the class clown more often than the older while the comic talents were more prevalent among the older. The correlations with the strengths factors gave a clear pattern of results. All

Table 2 | Correlations between class clown dimensions and demographic variables, character strengths, life satisfaction and orientations to happiness.

	FUPC	O4.1	O4.2	O4.3	O4.4
Age	0.07	−0.10*	0.29*	0.06	−0.09
Gender	−0.24*	−0.19*	−0.09	−0.21*	−0.23*
Leadership strengths	0.20*	0.17*	0.37*	0.00	0.02
Temperance strengths	−0.32*	−0.24*	−0.18*	−0.31*	−0.23*
Intellectual strengths	−0.04	0.01	0.07	−0.17*	−0.03
Transcendence strengths	−0.04	0.05	−0.06	−0.08	−0.04
Other-directed strengths	−0.17*	−0.08	−0.06	−0.19*	−0.18*
Creativity	0.00	0.02	0.12*	−0.16*	0.01
Curiosity	−0.02	0.00	0.09	−0.10	−0.05
Open-Mindedness	−0.08	−0.06	0.03	−0.16*	−0.08
Love of learning	−0.17*	−0.09	−0.07	−0.26*	−0.11*
Perspective	0.07	0.07	0.23*	−0.09	−0.01
Bravery	0.04	0.08	0.15*	−0.07	−0.06
Perseverance	−0.19*	−0.07	−0.07	−0.26*	−0.15*
Honesty	−0.24*	−0.11*	−0.10	−0.27*	−0.23*
Zest	0.04	0.09	0.17*	−0.13*	−0.05
Love	0.01	0.04	0.13*	−0.10	−0.07
Kindness	−0.04	0.03	0.04	−0.10	−0.10
Social Intelligence	−0.03	−0.03	0.15*	−0.15*	−0.10
Teamwork	−0.08	−0.04	0.08	−0.19*	−0.12*
Fairness	−0.14*	−0.08	−0.04	−0.17*	−0.15*
Leadership	0.14*	0.11*	0.24*	0.00	0.06
Forgiveness	−0.02	0.03	0.05	−0.10*	−0.06
Modesty	−0.18*	−0.14*	−0.10	−0.15*	−0.15*
Prudence	−0.25*	−0.17*	−0.13*	−0.26*	−0.19*
Self-regulation	−0.23*	−0.19*	−0.10*	−0.22*	−0.18*
Appreciation of beauty and excellence	−0.03	0.04	0.03	−0.15*	−0.02
Gratitude	−0.02	0.02	0.09	−0.09	−0.08
Hope	−0.01	−0.03	0.13*	−0.07	−0.09
Humor	0.37*	0.34*	0.51*	0.10*	0.11*
Religiousness	−0.02	0.04	−0.08	−0.03	0.03

N = 630. FUPC, first unrotated principal component; O4.1, class clown role (Identified as the class clown); O4.2, comic talent; O4.3, disruptive rule-breaker; O4.4, subversive joker.

*p < 0.01.

class clown dimensions were low in temperance (confirming Hypothesis 1), the two negative ones (and the FUPC) were low in other-directed strengths (Hypothesis 4) and the factors 1 and 2 (and the FUPC) were high in leadership (Hypothesis 3). The "Disruptive rule breaker" was additionally lower in intellectual strengths (Hypothesis 5). The correlations with the 24 character strengths were examined next and the overall class clown dimension and the four types yielded different correlational profiles. The FUPC was positively related to humor and leadership, and negatively with seven strengths including prudence, self-regulation and honesty. The identification with the class clown role went along with humor and leadership and lower scores in the strengths of prudence, modesty, self-regulation and honesty. Thus, overall the correlation pattern was similar to the one of the FUPC. The "Comic talent" was characterized by nine strengths (most notably humor, leadership, and perspective) and by the absence of two strengths (prudence and religiousness). The "Disruptive rule breaker" was slightly higher in humor but lower in 14 of the 24 strengths (most noticeably, in honesty, prudence, love of learning, and perseverance). The "Subversive joker" tended to be slightly higher in humor, but also lower in eight strengths, but these correlations were low except the one with honesty.

SIGNATURE STRENGTHS OF CLASS CLOWNS

A final analysis looked at the rank of the character strengths of class clowns and non-class clowns. This analysis disregards the level of strengths but looks at the order of strengths for each individual. For each student the 24 YIA-Youth scores were ranked (from 1 to 24) and the mean profiles for class clowns and non-class clowns were computed and is displayed in **Figure 2**.

For class clowns, the ranks were higher for humor ($r = 0.29$; $p < 0.01$), leadership ($r = 0.09$; $p < 0.01$) and perspective ($r = 0.08$; $p < 0.05$), and lower for love of learning ($r = −0.13$; $p < 0.01$), honesty ($r = −0.12$; $p < 0.01$), modesty ($r = −0.11$; $p < 0.01$), self-regulation ($r = −0.09$; $p < 0.05$), and perseverance ($r = −0.08$; $p < 0.05$). While humor seemed to be a signature strength of class clowns (mean rank = 4.5; compared to the mean rank of non-class clowns: 11.0), perspective (mean rank: 11.6) and leadership (mean rank: 12.8) do not show up among the top strengths although it does more frequently than for non-class clowns. The lowest ranked strengths are love of learning ($M = 16.0$), perseverance ($M = 16.2$), self-regulation ($M = 16.6$), modesty ($M = 16.6$), religiousness ($M = 17.0$), and prudence ($M = 18.4$). It should be noted that while these were the lowest ranked strengths among the class clowns the mean ranks do not reach as far to the end of the scale as humor does. The fact that humor is a signature strength of class clowns was underscored by the fact that 29.1% had it place as the top strength (compared to 7.7% of the non-class clowns), 62.8% among the top three (non-class clowns = 20.7%), and 75.5% (non-class clowns = 30.1%) among the top five strengths. This confirms Hypothesis 7 (the numbers for the subfactors were 81.1, 55.4, 61.9, and 51.6%, respectively). The fewest strengths class clowns had among their highest five were prudence: 1.2% (non-class clowns: 5.9%), modesty: 4.8%
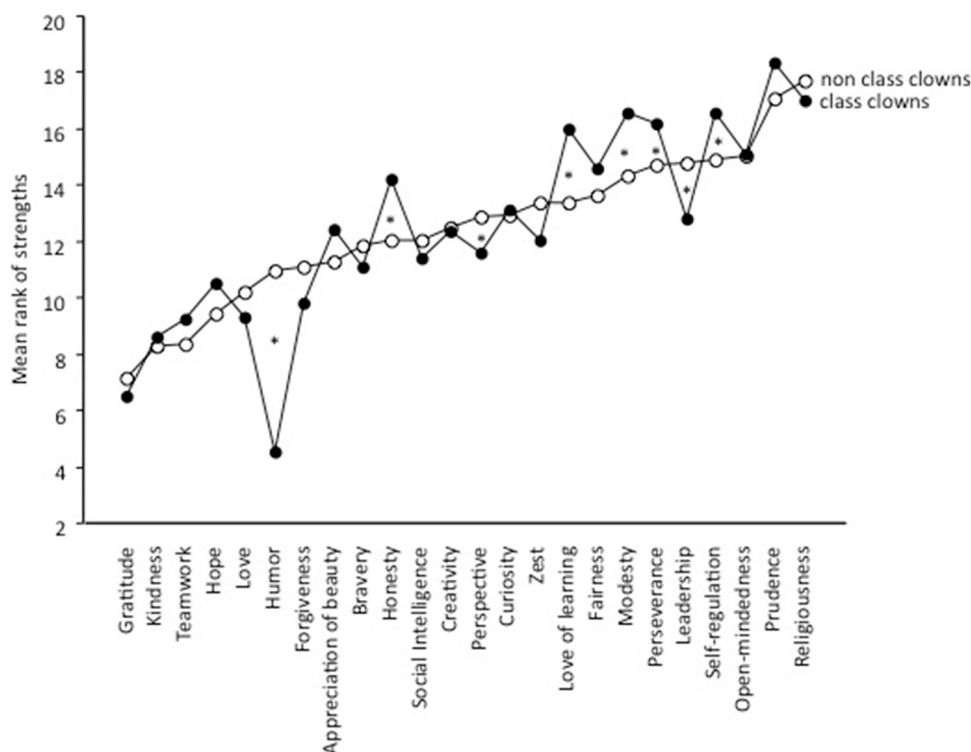
FIGURE 2 | Mean ranks in the 24 strengths for class clowns and non-class clowns separately.

(non-class clowns: 14.2%), and self-regulation: 7.1% (non-class clowns: 8.9%).

Finally, we examined humor as a signature strength balanced and unbalanced by prudence. Individuals with humor among the top five strengths were separated from those that did not have humor as signature strength. Furthermore, a second distinction was made depending on prudence was among the top 12 strengths or lower 12 strengths[3]. This allows testing the effects of prudence or low prudence among people for whom humor is a signature strength (i.e., Hypothesis 8). A 2 × 2 ANCOVA was performed with humor and prudence as independent variables and the rule breaker scores as a dependent variable (and gender and age as covariates).

There was a significant interaction between humor and prudence, $F_{(1, 627)} = 5.27$, $p < 0.05$, $\eta_p^2 = 0.008$. Only the combination of humor as a signature strength and low expression of prudence went along with high scores in being a disruptive rule breaker (**Figure 3**). If prudence was high, it did not matter whether humor was the signature strength or not. When prudence was low then humor was a condition for disruptive rule-breaking.
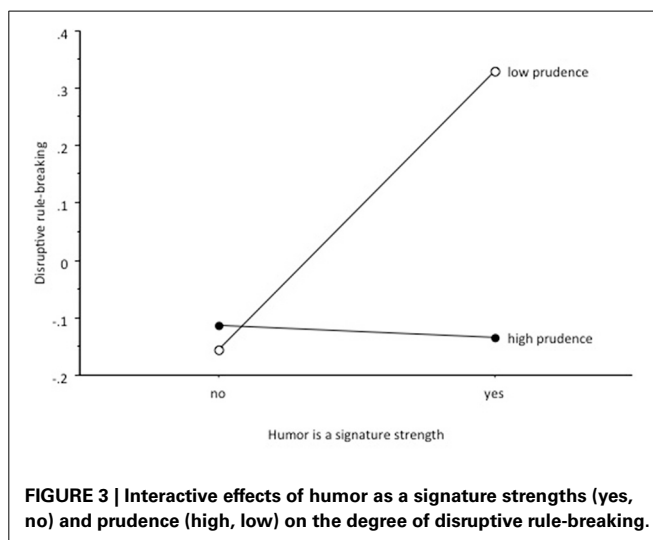
FIGURE 3 | Interactive effects of humor as a signature strengths (yes, no) and prudence (high, low) on the degree of disruptive rule-breaking.

THE CLASS CLOWNS ORIENTATIONS TO HAPPINESS AND SATISFACTION WITH LIFE

Finally, the class clown data were correlated with the orientations to happiness (OTH) and life satisfaction (Hypothesis 9). **Table 3** shows the correlations.

From **Table 3** it is clear that class clown behavior did go along with a life of pleasure; i.e., class clowns follow the principle of hedonism and maximize pleasure (Hypothesis 2). There

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[3]The choice of the "top five" for humor is in line with the idea that there are "signature strengths" and that their number is assumed to be between 3 and 7. In most studies five signature strengths are assumed. Prudence is not a signature strength, so we somewhat arbitrarily divided individuals into "high" and "low" using the numerical midpoint (i.e., 12.5).

Table 3 | Correlation between class clown dimensions and orientations to happiness and global satisfaction with life controlled for age and gender.

	FUPC	O4.1	O4.2	O4.3	O4.4
Pleasure (OTH)	0.29*	0.25*	0.26*	0.18*	0.17*
Engagement (OTH)	−0.09	0.08	−0.04	−0.23*	−0.08
Meaning (OTH)	0.02	0.13*	0.03	−0.06	−0.04
SLSS	−0.05	−0.02	0.04	−0.12*	−0.06

N = 338. FUPC, first unrotated principal component; O4.1, class clown role; O4.2, comic talent; O4.3, disruptive rule-breaker; O4.4, subversive joker.
*p < 0.05.

was a small positive correlation between life of meaning and "identifying as the class clown." The "disruptive rule-breaker" was lower in life of engagement; i.e., they do not get immersed in challenges, don't experience flow but rather the opposite (supporting Hypothesis 6). More importantly, there was also a lower correlation with global life satisfaction (confirming Hypothesis 9). One should add that humor and life satisfaction were positively correlated, $r = 0.23$, $p < 0.001$ (controlled for gender and age). Removing humor (and age and gender) from the relationship between class clowning and life satisfaction yielded negative correlations for the FUPC ($r = -0.12$, $p < 0.01$), the factors "Identified as a class clown" ($r = -0.12$, $p < 0.01$), "Disruptive rule breaker" ($r = -0.10$, $p < 0.01$), and "Subversive joker" ($r = -0.08$, $p < 0.05$), but not the "Comic talent" ($r = -0.06$, $p = 0.13$). Finally, partial correlations show that removing humor (in addition to age and gender) does not substantially reduce the correlation between the FUPC and the life of pleasure ($r = 0.22$; $p < 0.001$); i.e., the liking of pleasure of class clowns goes beyond the effects of humor. However, the overall class clown behavior (i.e., the FUPC) is now significantly negatively correlated with life of engagement ($r = -0.18$; $p < 0.001$), while the negative correlation with life of meaning fails to be significant ($r = -0.09$; $p = 0.09$).

DISCUSSION

The present study allows three major conclusions. First, it is evident that a behavior-centered, dimensional approach to class clowning is possible if not favorable. Second, class clown behavior can be described in this dimensional approach using a hierarchical model with a broader factor on the top that unites four positively related lower order dimensions. Third, variables from positive psychology (e.g., character strengths, orientations to happiness) are well-suited to predict why certain people are involved in class clowning and others aren't. They help drawing an overall picture of class clowns and contribute to the differentiation of the four dimensions.

Indeed, the dimensional self-report approach proposed in the present article can be seen as a valuable complement to the person-centered type approach based on teacher or peer nominations as it replicates insights from the latter but goes beyond it. Also in the present study the different estimations of the frequency of class clowns assume the number to be low and vary around 10% (teachers nomination: 11%, self-report: 13%, total

score > 3.5: 13%, total score > 4: 5%). Furthermore, both the teachers nominations and the self-reports (items 4 and 9, and the total score) showed that there is variations among the class clowns: they were nominated by a varying number of teachers (13–83%) and the magnitude of agreement to the class clown questions varied, too (between 4 and 5.6 on the 6 point scale; i.e., between "slightly agree" and "strongly agree"). Thus, the agreement is far from being perfect. Moreover, in the distribution of the continuous data no apparent discontinuity could be observed and the distribution was not bimodal. Thus, while it is possible to divide students into class clowns and non-class clowns, this distinction will remain arbitrary. The outcome depends on the measurement used, the boundaries are blurry and do not allow for a clear cut-off score, and there is a lot of variance within both groups. Again, these factors speak for a dimensional approach, which also approximates the common observation that the actual high scorers are rare and most people do not involve in class clown behavior. Finally, also in the dimensional approach boys seem to be the gender involved in class clowning; while only 38% of the sample were boys, they were 56% of the class clowns. Should the dimensional approach be applied in the future more research is needed on defining and justifying cut-off scores.

The second major outcome is a tentative descriptive model along with a preliminary instrument for its assessment. We propose to study class clown behavior at two levels. At the first level, the data are well represented by a strong general factor (i.e., the first unrotated principal component) loaded highly by all items reflecting the amount someone is involving in class clown behavior. The sum of the 18 items yields a reliable measure that also is reasonably balanced across the four domains. Therefore, the total score is recommended for use in studies. At the second level of analysis, this general factor may be split up into four correlated components, namely the "Identified as a class clown," "Comic talent," "Disruptive rule breaker" and the "Subversive joker." Factor 1 (i.e., being identified as a class clown) describes that pupils have adopted the role of a class clown. While factors 2 to 4 describe different styles of class clown behaviors, this factor represents the crystallization of showing these behaviors for a while (Hobday-Kusch and McVittie, 2002). The high scorer had used humor to negotiate power with teachers and gaining approval or at least attention from their peers. This also includes that the class clown is aware that others expect certain actions from them. We expect that the scores get higher with time. Factor 2 ("the comic talent") refers to a class clown behavior that is based on quick-wittedness and is more characterized by spreading good cheer and entertaining others. This type of class clown behavior might be seen as less disturbing by the teachers and it might even be the humor that is welcome also in schools. More people did show it (compared to the other factors) and the scores were normally distributed. It is likely that this class clown is not only liked by their peers but also accepted by teachers. He or she will have a certain status in class, maybe being the second leader in class after the teacher. The other two class clowning dimensions are more conflict-prone as they go against classroom rules and challenge the teacher. The "disruptive rule breaker" is the visible opponent of the teacher; he or she does not take seriously what the teachers say, dismisses what is said to be important, pokes fun what that the teacher says or does

and undermines his authority. The "subversive joker" is undermining the authority of the teacher but not necessarily in direct confrontation. He or she also plays pranks on classmates. He is competitive in playing pranks and needs the attention of the class. These labels are preliminary and might be updated once a new batch of items will be studied together with the present item pool. For now, the factor scores serve as preliminary measures of the dimensions but a further development of the instrument should have subscales.

As a third major outcome one can state that the concepts of character strengths, signature strengths and orientations to happiness are useful in predicting individual differences in class clown behavior and allowed to test several hypotheses regarding overall class clowning, as well as the four dimensions. Overall, class clown behaviors are more frequent among those lower in temperance strengths (in particular prudence) (Hypothesis 1), but high in life of pleasure and humor (Hypothesis 2). Indeed, humor is the only common signature strengths among class clowns (Hypothesis 7), and it may be conducive to be applied in a less appropriate place especially if it is not balanced out by prudence (Hypothesis 8). These dispositions are predictive of all forms of class clowns and they might be relevant at different stages in class clown behaviors. An orientation toward pleasure might extend to the classroom situation that is not conducive to having fun. Humor is a vehicle for producing amusement, which, if someone lacks prudence/temperance, also gets expressed in a setting where it might not be appropriate or even gets sanctioned. In the study by Damico and Purkey (1978) class clowns were found to be high in "cheerfulness," but this was a smaller effect. This might be due to the fact that cheerfulness and humor only overlap partially.

Specific predictors of the four dimensions complement this nucleus of class clown dispositions. Damico and Purkey (1978) found class clowns to be high in leadership (Hypothesis 3). The present study shows that this applies primarily to the "Comic talent," but can also be found for the "Identified as a class clown"-dimension and the first unrotated factor. While the two negative dimensions of class-clown behaviors (i.e., "rule breaking" and "subversive joking") do not go along with leadership they are typical for students low in other-directed strengths (Hypothesis 4). Playing pranks and breaking rules in classroom is more likely among those with lower orientations to the community. It should be noted that the scores in "comic talent" and "identified as a class clown" and do not predict undermining teachers authority or breaking the rules set. Furthermore, it seems that intellectual strengths and pursuing a life of engagement are protective factors against disruptive rule breaking (Hypothesis 5, Hypothesis 6). Being equipped with school-related strengths (e.g., love of learning, perseverance) and disposed toward flow will leave little room for being distracted and bored at school, which might be one base of triggering class clown behavior. Finally, life satisfaction tended to correlate negatively with all class clown dimensions (Hypothesis 9). This was significant for the disruptive rule breakers (zero-order correlations) and all dimensions except the comic talent (partial correlations controlling for age, gender and humor). This finding is interesting, as humor as a strength may generate positive emotions and improve social

relations. Hence humor is typically predictive of life satisfaction and well-being (Ruch et al., 2010). However, humor in an inappropriate setting may also lead to negative consequences, and thus overall detrimental to well-being. Future studies should examine the relationship with well-being at school or satisfaction with school experiences, as these will reflect the class clown effects more strongly and mediate the relationship between humor in schools and global life satisfaction. Overall the findings for the four factors suggest that it is fruitful to distinguish dimensions of class clown behaviors and stop looking at it as a unitary concept.

These initial findings need to be interpreted in the context of some limitations. A prime limitation is the snapshot characteristic of the results. It does not take into account that strengths develop or change as a function of experience. The results are interpreted as the strengths facilitating the class clowning behavior. Right now we see that, for example, the rule breaker is lower in love of learning, endurance, honesty, and prudence and one might speculate that lower expressions in these strengths facilitate class clown behavior. The causality could be in the other direction, being the humorous opponent of the teacher might also shape the leadership role. And it might be that other variables affect both the emergence of class clown behaviors and character. Also, the current approach does not look for interactions with type of subject taught and with teacher's characteristics. We do not know whether class clowning is depending on these factors or independent from them. Another limitation is that the present study takes all age ranges together. It might be that the nature of the clowning behavior changes with age (e.g., from behavioral to verbal humor, or from doing silly things to doing targeted attacks). It is also possible that the type of school will play a moderating role. Is it a class of academically gifted students, or a class where pupils are prepared to work in a vocational profession?

The low correlation with the humor scale requires some further discussion. While humor is the only consistent signature strength of class clowns it is also obvious that mostly the "Comic talent" dimension is predicted by the VIA-Youth humor scale. The correlations with the "Disruptive rule-breaker" and "Subversive joker" dimensions are rather low. This might be explained by the fact that in the VIA-Classification of Strengths humor is intentionally restricted to forms of humor that serve some moral good. Peterson and Seligman (2004) did define the humorous individual as one "... who is skilled at laughing and teasing, at bringing smiles to the faces of others, at seeing the light side, and at making (not necessarily telling) jokes (p. 530)." Empirical studies using the VIA-IS scale (and other conceptualizations of humor) show that humor is most strongly related to humanity. However, subversive and disruptive class clowning will not be guided by humanity; i.e., it is amusing others by tricks, jokes, odd gestures and postures, or pranks. Seligman (2014) discusses that in Petersons model of the "real mental illnesses" the excess of humor as a strengths might be buffoonery; i.e., "ridiculous but amusing," foolish or playful behavior or practice. *This "excess of humor" is not measured through the VIA-IS.* Research in adults has shown that humor is multidimensional involving also more negative forms of humor, such as mean-spirited or earthy humor. Interestingly, Müller and Ruch (2011) demonstrated that

earthy or mean-spirited types of humor were negatively related to temperance; i.e., modest, prudent or self-regulated individuals less often indulged in them. Thus, future studies should use other components of humor to predict the class clown behavior. Katagelasticism (i.e., the joy of laughing at others) and other forms or corrective humor (Ruch and Proyer, 2009) might be more characteristic for the disruptive rule breaker and the subversive joker while at the same time being less predictive of the comic talent. Likewise, a more comprehensive approach could be used (e.g., the HBQD by Craik et al., 1996). In such a study the systematic comparison of teacher evaluations with self-reports and peer-reports describing the behavior are of interest as Damico and Purkey (1978) reported that some teachers fail to distinguish between comic and hostile humor, and classify it all as disruptive without seeing positive ways in which to use humor to meet their own objectives. Furthermore, a study is needed that collects examples of humor shown in class and actually analyses the type of humor displayed. It is possible that some of the behaviors shown are merely disruptive or rude and do not contain elements of humor. Alternatively and more likely, the behaviors are better described as ridicule, laughing at, sheer mockery, parody, or corrective humor. They might also be more imaginative. Clearly, studies are needed that analyze the nature of the funny behavior (if it is funny at all).

CONCLUSIONS

The "class clown" is better conceptualized as continuous rather than categorical and as multi- rather than unidimensional. Humor is the shared signature strength of 75% of the class clowns. Furthermore, the class clowns do have strengths, and one of the dimensions goes along with even several strengths. The apparently more antagonistic class clown factors seem to be associated with lower expressions in strengths. The rule breaker is lower in life of engagement. Thus, activating the strengths that are conducive to positive affect might be a way to indirectly approach the problems (Weber and Ruch, 2012; Weber et al., submitted). However, the dynamics must be better understood. For teachers there will be the challenge of preventing class clown behavior by considering the conditions that bring about this behavior and to mastering class clown behavior more effectively. Maybe the concept of use of signature strengths will be important in this context. In general humor serves a variety of functions (e.g., it manages relationships, it buffers stress, it energizes, it helps influencing) and some of these are highly relevant at school. The teacher might use humor to melt down conflicts and tension with humorous remarks, highlight a point with humor so that it is more easily remembered, or humor can make students laugh and be distracted but then alert again after laughter etc. Students with humor as a signature strengths will want to use humor too during class or during breaks. When humor interrupts the flow of teaching, or is directed at classmates or the teacher it can be seen as a misuse of a strength (Webb, 1994). When it is used constructively students might use it for building relations, leading, influencing or highlighting points, energizing, resolving conflicts, managing emotions etc. Generally the school setting will favor strengths like perseverance, love of learning, prudence, self-regulation, teamwork and social intelligence (Weber and Ruch, 2012; Weber et al.,

submitted) and students having these strengths among their signature strengths will thrive in this context more easily than those who don't. Naturally, the fit between humor and a teaching institution might me lower at first glance, but if humor is granted a place in school it will help students with humor as a signature strength to feel at home at school as well. Whether or not they don't use humor in a detrimental way needs to be studied.

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Good character at school: positive classroom behavior mediates the link between character strengths and school achievement

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Character strengths have been found to be substantially related to children's and adolescents' well-being. Initial evidence suggests that they also matter for school success (e.g., Weber and Ruch, 2012). The present set of two studies aimed at replicating and extending these findings in two different age groups, primary school students ($N = 179$; mean age = 11.6 years) and secondary school students ($N = 199$; mean age = 14.4 years). The students completed the VIA-Youth (Values in Action Inventory of Strengths for Youth), a self-report measure of the 24 character strengths in the VIA classification. Their teachers rated the students' positive behavior in the classroom. Additionally, school achievement was assessed: For the primary school students (Study 1), teachers rated the students' overall school achievement and for the secondary school students (Study 2), we used their grades as a measure of school achievement. We found that several character strengths were associated with both positive classroom behavior and school achievement. Across both samples, school achievement was correlated with love of learning, perseverance, zest, gratitude, hope, and perspective. The strongest correlations with positive classroom behavior were found for perseverance, self-regulation, prudence, social intelligence, and hope. For both samples, there were indirect effects of some of the character strengths on school achievement through teacher-rated positive classroom behavior. The converging findings from the two samples support the notion that character strengths contribute to positive classroom behavior, which in turn enhances school achievement. Results are discussed in terms of their implications for future research and for school interventions based on character strengths.

Keywords: character strengths, virtues, VIA classification, positive education, adolescents, positive psychology, school achievement, character

Introduction

School achievement is substantially linked with later life outcomes (for an overview, see e.g., Duckworth and Allred, 2012). Behavior in the classroom was found to predict later academic achievement (Alvidrez and Weinstein, 1999) and also important life outcomes in education and the labor market, even beyond the influence of achievement in standardized tests (Segal, 2013). Therefore, studying the influence of non-intellectual aspects on educational outcomes has a long tradition. Also specifically studying good character or positive personality traits had already been

addressed by early educational psychologists (e.g., Smith, 1967), but had then been neglected for a long period of time. Only with the advent of positive psychology, it has received revived interest.

Within positive psychology, education is seen as an important area of application. Seligman et al. (2009) defined positive education as "education for both traditional skills and for happiness" (p. 263). Inherent in positive education is the idea that good character, positive behaviors at school and academic achievement are not only aims of education, but also closely intertwined. However, little is known empirically about this interplay. The importance of good character in education has recently been emphasized both in scientific and popular literature (e.g., Tough, 2012; Linkins et al., 2015) and researchers from neighboring disciplines (e.g., Hokanson and Karlson, 2013) have also called for studying the role of character strengths in education.

In the present paper, we take a closer look at the link between students' character strengths and school achievement and investigate the mediating role of positive behavior in the classroom further. More specifically, we examine whether character strengths facilitate positive classroom behaviors, which in turn facilitate attaining higher grades. Character strengths are not only expressed in thoughts and feelings, but importantly, also in behaviors (Peterson and Seligman, 2004). We expected that a number of strengths are very helpful for schoolwork and are thus robustly related to positive behaviors in the classroom, as the teachers can observe it. Such positive classroom behaviors, e.g., actively in class or showing motivation to learn, should ultimately contribute to school achievement. We aim to provide a better insight into which aspects of good character are reliably linked with school achievement and positive classroom behavior and for which of the character strengths the link between them and school achievement is mediated by positive classroom behavior. To achieve this aim, we use two samples representing primary and secondary education, and perform analyses on the level of single character strengths. This detailed level of analysis may be especially interesting when relating the results to programs that emphasize the cultivation of certain character strengths.

Character Strengths in Children and Adolescents

Peterson and Seligman's (2004) classification allows studying good character and its contribution to positive development in a comprehensive way. The VIA classification describes 24 character strengths, that are organized under six, more abstract, virtues (wisdom and knowledge, courage, humanity, justice, temperance, and transcendence) and are seen as ways to reach these virtues. Character strengths are seen as inherently valuable, but also contribute to positive outcomes (Peterson and Seligman, 2004). Character strengths can be seen as the components of a good character, and are described as the inner determinants of a good life, complemented by external determinants (such as safety, education, and health; cf. Peterson, 2006). Since the development of the VIA classification and the Values in Action Inventory of Strengths for Youth (VIA-Youth; Park and Peterson, 2006), which reliably assesses the 24 character strengths in children and adolescents between 10 and 17 years, a number studies in different cultures have revealed substantial links between character strengths and

subjective well-being of children and adolescents (Van Eeden et al., 2008; Gillham et al., 2011; Weber et al., 2013; Ruch et al., 2014b).

Character Strengths and School Achievement

A large number of studies have examined the links between broad personality traits and academic achievement. Meta-analyses (e.g., Poropat, 2009, 2014a) reveal that conscientiousness is the strongest correlate, whereas the links between extraversion, neuroticism, agreeableness, and openness/intellect with academic achievement have been rather weak and inconsistent. These links are largely independent of intelligence (Poropat, 2009) and personality traits have even been found to be equally strong predictors of academic achievement than intelligence when they were self-rated, and even stronger predictors when they were other-rated (Poropat, 2014a). In the available meta-analyses on the relationship between self-rated personality traits and academic achievement, almost all included studies examined students in tertiary education (Poropat, 2009) or they even focused only on postsecondary education (e.g., Richardson et al., 2012; McAbee and Oswald, 2013). A recent meta-analysis (Poropat, 2014b), however, examined the predictive validity of adult-rated personality traits for academic achievement in primary education and found that conscientiousness and openness had the strongest correlations with measures of school achievement. Still, it has to be noted that we know a lot more about how personality, especially when it is self-rated, is related to academic achievement, and about what might be relevant mechanisms behind it, in young adults than we know about these relationships in children and adolescents. And, although authors have speculated that the relationship between personality and academic achievement is attributable to "positive traits that naturally promote academic learning" (Medford and McGeown, 2012, p. 787), those studies did not investigate narrower, positively valued personality traits specifically.

Some aspects of good character have been studied in relation to school achievement. Duckworth and colleagues (Duckworth and Seligman, 2005; Duckworth et al., 2007) demonstrated the relevance of self-regulation and grit for academic achievement beyond measured intelligence. Also other character strengths, such as hope (e.g., Levi et al., 2014), have been shown to relate to academic achievement. In contrast to approaches that consider only some aspects of good character, the VIA classification (Peterson and Seligman, 2004) offers a comprehensive catalogue of character strengths. Weber and Ruch (2012) provided an initial investigation of the role of the 24 character strengths in school. In a sample of 12-year old Swiss school children, they studied the relationship between character strengths, positive experiences at school, teacher-rated positive classroom behavior, and school achievement. A factor representing character strengths of the mind (e.g., love of learning, perseverance, prudence) was related to school achievement, which was operationalized by grades in mathematics and German language. Specific character strengths (e.g., perspective, gratitude, hope, self-regulation, perseverance, love of learning) were higher in those students with improved grades during the course of the school year, than in those with decreased grades. Similarly, in a sample of Israeli adolescents at

the beginning of middle school, Shoshani and Slone (2013) found intellectual and temperance strengths to be predictors of grade point average (GPA).

Character Strengths and Positive Classroom Behavior

Park and Peterson (2006) found moderate convergence between self- and teacher-reported character strengths and argued that certain strengths may be more readily observable in the classroom than others. Especially phasic strengths, which can only be displayed when the situation demands it (e.g., bravery), may be more difficult to observe than tonic strengths, which can be displayed in any situation (e.g., kindness; cf. Peterson and Seligman, 2004). Even though the frequency might vary, character strengths are expressed in overt behavior, so they should also contribute to positive behavior in the classroom. In particular, temperance strengths (e.g., prudence, self-regulation) should be helpful to regulate feelings, thoughts, and behaviors in a way that matches the expectations and norms in the classroom (e.g., showing good conduct). Other strengths, such as social intelligence should be helpful to manage conflict and relationships with classmates successfully, and thus be related to social aspects of positive classroom behavior (e.g., being cooperative). Finally, strengths that were found to be related to school achievement, such as perseverance and love of learning, should also be associated with achievement-related aspects of positive classroom behavior (e.g., working autonomously).

Empirically, Shoshani and Slone (2013) found interpersonal strengths to be related with social functioning at school, which was rated by the teachers, and thus might represent positive social classroom behavior. Weber and Ruch (2012) have studied the relationship with character strengths and positive classroom behavior using their Classroom Behavior Rating Scale (CBRS), assessing both achievement-related and social classroom behavior. In a multiple regression analysis, about 25% of the variance in teacher-rated positive classroom behavior was explained by the 24 character strengths. Perseverance, prudence, and love of learning showed the most substantial correlations with teacher-rated positive classroom behavior.

Positive Classroom Behavior as a Mediator of the Relationship between Character Strengths and School Achievement

High scores in good character do not automatically and directly lead to high levels of school achievement, but they will predispose students to show a set of more proximate behaviors, which in turn predispose for higher grades later on. Thus, if certain character strengths are identified as being related to school achievement, it is of course interesting to examine potential mechanisms involved. One likely candidate for explaining this link is positive behavior in the classroom, since the grading of students is largely depending on the behaviors that teachers can observe in the classroom, and especially such behaviors that they value (e.g., showing a high motivation to learn, adhering to classroom rules). Weber and Ruch (2012) used a latent variable representing classroom-relevant character strengths (love of learning, perseverance, and

prudence) showed an indirect effect on school achievement mediated by positive classroom behavior. After adding the mediator to the model, there was no direct effect of character strengths on school achievement, which is in line which a full mediation by positive classroom behavior.

Aims of the Present Study

The presented studies strongly suggest that character strengths are indeed important resources at school, supporting school achievement either directly, or also indirectly via the display of positive behavior in the classroom. There is, however, a need to further investigate these relationships to examine their robustness and also potential moderators. In addition, these initial studies also have several limitations. First, many included only students in rather narrow age ranges and from one level of education. While the study by Weber and Ruch (2012) does include a broader range of level of education, it may be somewhat limited by the fact that teachers only knew their students for about three months when they were rating their positive classroom behavior. Second, in most studies, character strengths were analyzed only on the factor level–four factors in Shoshani and Slone (2013) and two factors in Weber and Ruch (2012)–and it is difficult to draw conclusions on the level of specific strengths based on these results. Doing so may be especially interesting when evaluating the results in light of programs or interventions that build on the cultivation of certain strengths (e.g., grit/perseverance or self-regulation).

The present studies aimed at replicating the findings by Weber and Ruch (2012) and extending them by including students in different school types (Study 1: primary school, Study 2: secondary school) and a broader range of school grades beyond grades in mathematics and German language (Study 2). We will also investigate for each of the character strengths individually whether the potential link with school achievement is mediated by positive classroom behavior. In doing so, the present study will add to the knowledge on the role of positive traits for positive behavior and achievement at school.

While none of the 24 character strengths should be detrimental for positive classroom behavior or school achievement, certain strengths should be more important than others. Based on theoretical assumptions and previous empirical findings, we expect certain character strengths to be related to positive classroom behavior and school achievement most strongly. These nine character strengths are: perseverance, self-regulation, prudence, love of learning, hope, gratitude, perspective, teamwork, and social intelligence.

Firstly, we expect *perseverance* to be robustly related to the educational outcomes measured. Students high in perseverance are characterized by "voluntary continuation of a goal-directed action in spite of obstacles, difficulties, and discouragements" (Peterson and Seligman, 2004, p. 229). Such behaviors are highly advantageous in a school environment, in which challenging goals are presented and sustained efforts despite obstacles are needed to accomplish them. Since perseverant individuals enjoy finishing tasks, the completion of, e.g., an assignment may be particularly rewarding for them. Thus, perseverance can be seen as a helpful resource both for displaying positive behavior in the classroom (e.g., behaving diligently) and for school achievement, because

perseverant students will work persistently on tasks and homework, even when it is difficult, and thus might be more successful in consequence. Secondly, *self-regulation* is expected to be associated with educational outcomes. Self-regulation helps to control own feelings and appetites. Thus, it is helpful to avoid obstacles and reach goals or meet expectations of others (cf. Peterson and Seligman, 2004). At school, it is often demanded and expected to control one's own feelings and to conform to what is expected (cf. Ivcevic and Brackett, 2014). Consequently, self-regulation will likely go along with helpful behaviors and strategies at school, such as managing time well, making plans and sticking to them, and adhere to rules. These positive behaviors will be observable in the classroom and may also contribute to higher grades. Thirdly, we expect *prudence* to be related mostly to positive behavior in the classroom, but also to school achievement. Students high in prudence that are particularly careful in their choices (cf. Peterson and Seligman, 2004) are less likely to do things in the classroom that fall outside the teachers' and classmates' expectation. Consequently, they are more likely to comply with rules and work toward achieving what is expected of them. Being prudent may also help to avoid interpersonal problems, and thus lead to better relationships with teachers and classmates, which then may be supportive of school achievement. Recently, Ruch et al. (2014a) established that there are different types of class clowns, but each of them was low in prudence. When we assume that class clowns would score quite low on teacher-rated positive classroom behavior and that their characteristics do not fit well with what is required in the classroom, this suggests that being prudent might be crucial for displaying positive behavior in the classroom. Fourthly, we expect *love of learning* to be relevant for predicting behavior and success at school. Individuals high in love of learning experience positive emotions when learning new things, and enjoy doing so whenever possible (cf. Peterson and Seligman, 2004). In any case, attending a school will offer opportunities to learn new things on a daily basis. It is likely that the high intrinsic motivation to learn also leads to better learning outcomes, and that the positive emotions associated with learning additionally foster school achievement (cf. Schutz and Lanehart, 2002; Weber et al., 2014). In the initial study by Weber and Ruch (2012), love of learning, perseverance and prudence were among the most important variables in predicting positive classroom behavior and also had an indirect effect on school achievement through positive classroom behavior.

In addition to these four strengths that are assumed to be helpful at school, we also expect *hope* to be related to behavior and achievement at school. Hopeful individuals are not only characterized by believing that a positive future is likely, but also by acting in ways supposed to make desired outcomes (e.g., achieving a good result in an exam) more likely (Peterson and Seligman, 2004). These desired outcomes can be both in relation to positive behavior in the classroom and to thoughts and behaviors that support achievement, but are not directly observable in the classroom (such as favorable attributions, etc.). Earlier studies have also found that hope predicts future academic achievement (e.g., Marques et al., 2011) as well as demonstrated a close link between hope, effort, and school achievement (Levi et al., 2014). Sixthly and seventhly, *perspective* and *gratitude* may also be relevant in

the classroom. Students high in the character strength perspective have consistent ways of looking at the topics and the world, which are meaningful to them and also make sense to others (cf. Peterson and Seligman, 2004). On the one hand, expressing and applying such coherent worldviews at school may help solving problems and integrating different perspectives. On the other hand, perspective is also displayed by giving good and wise advice to others, which may foster positive relationships with classmates, and in turn facilitate learning and achievement. Grateful students are highly aware of the positive things in their lives, and are thankful for these (cf. Peterson and Seligman, 2004). One of the mechanisms conceivable is that these students perceive school as a meaningful institution and are more aware than others of the possibilities that good achievement will offer them in the future. In the study by Weber and Ruch (2012), both perspective and gratitude were higher in those students that improved their grades over the course of the school year than in those that had deteriorated grades. Finally, we expect *social intelligence* and *teamwork* to be related to positive classroom behavior. School is an environment characterized by constant interactions with classmates and teachers. Highly social intelligent individuals understand both their own and others' feelings, and are able to adapt to other's feelings and expectations (cf. Peterson and Seligman, 2004). Similarly, individuals high in *teamwork* identify with a group of which they are members (e.g., a classroom) and do their share as group members because they fell if is the right thing to do (cf. Peterson and Seligman, 2004) Therefore, social intelligence and teamwork should both be linked with few conflicts, good cooperation, and adherence to expectations and rules in the classroom, which is all reflected in the teacher-rated positive classroom behavior.

Study 1

In Study 1, we aim at extending the findings by Weber and Ruch (2012), that is, that the association between certain character strengths and school achievement is mediated by positive behavior in the classroom. We investigate this relationship in a sample of primary school students and a sample of homeroom teachers, using a self-report measure of character strengths, and teacher ratings to assess positive classroom behavior and school achievement. Further, we extend previous studies by studying the assumed mediation on the level of single strengths. We expect an indirect effect mediated by positive behavior, and that the strength of this indirect effect varies for different character strengths.

Method
Participants
The sample of students consisted of 179 German-speaking primary school students (48.6% females) attending the fifth or sixth grade. Their mean age was 11.56 years ($SD = 0.75$; ranging from 10 to 13 years). The majority (86.6%) of participants were Swiss citizens (including dual citizens; data from one participant missing). The sample of teachers consisted of nine homeroom teachers (77.8% men) with a mean age of 36.2 years ($SD = 7.3$; ranging from

23 to 45 years). They had been teaching the participating students for an average of 1.4 years ($SD = 1.0$).
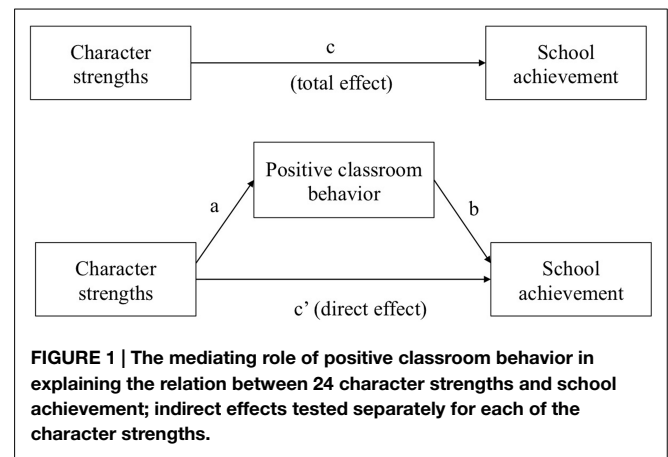
Instruments

The German adaptation (Ruch et al., 2014b) of the *VIA-Youth* (Park and Peterson, 2006) is a self-report instrument assessing the 24 character strengths uses seven to nine items per scale utilizing a 5-point response format (from 5 = *very much like me* to 1 = *not like me at all*). It consists of 198 items and about one third of the items are reverse coded. A sample item is "Even when my team is losing, I play fair" (fairness). The VIA-Youth proved to be a reliable and valid measure of self-reported character strengths in previous studies (e.g., Park and Peterson, 2006; Ruch et al., 2014b). In this study, most of the 24 VIA-Youth scales yielded satisfactory internal consistencies (i.e., 17 scales had alpha coefficients > 0.70) and only five scales (modesty: $\alpha = 0.51$, curiosity: $\alpha = 0.55$, open-mindedness: $\alpha = 0.61$, fairness: $\alpha = 0.62$, and prudence: $\alpha = 0.63$) had alpha coefficients < 0.65. Altogether, the internal consistency coefficients of the 24 VIA-Youth scales yielded a median of $\alpha = 0.72$. Means for each of the five factors (leadership, temperance, intellectual, transcendence, and other-directed strengths) were computed (cf. Weber et al., 2013; Ruch et al., 2014b).

The *CBRS* (Weber and Ruch, 2012) assesses teacher ratings of their perceptions of positive behavior in the classroom. The 10 items use a 5-point response scale (from 1 = "not like him/her at all" to 5 = "very much like him/her") and include both positive achievement-related behavior (e.g., "behaves diligently") and positive social behavior (e.g., "shows appropriate conflict management"). In the present study, the scale yielded a high internal consistency ($\alpha = 0.89$).

A teacher rating was also used to assess *school achievement*. Homeroom teachers were instructed to rate the "overall school achievement" (taking into account performance in all subjects) on a scale ranging from 1 = "unsatisfactory" to 7 = "excellent."

Procedure

Data for this study were collected in nine classrooms of three primary schools in German-speaking Switzerland. After obtaining approval by the ethical committee of the philosophical faculty at the University of Zurich, schools were contacted and asked to participate. Participation was voluntary and none of the students or teachers was paid for their participation. All students and a parent or legal guardian gave active consent to participate. A trained psychologist instructed the students and they completed the self-report questionnaires (as part of a larger questionnaire study) in the classroom setting. The teachers completed the rating form. Students received written feedback on their individual rank order of character strengths and were provided with more detailed information on the meaning of the character strengths in the VIA classification. The presented data were collected as a part of a larger project. Whereas Weber et al. (2014) focused on the relationships between character strengths, school-related positive affect, and school achievement in students attending different school types, the present study uses a subset of the sample used by Weber et al. (2014), i.e., only primary school students, and it investigates the relationships between character strengths, positive classroom behavior, and school achievement.

FIGURE 1 | The mediating role of positive classroom behavior in explaining the relation between 24 character strengths and school achievement; indirect effects tested separately for each of the character strengths.

Data Analysis

The nine character strengths expected to show the most substantial associations were spread out to four of the five higher-order factors (cf. Ruch et al., 2014b) and five (Ruch and Proyer, 2015) or six (Peterson and Seligman, 2004) of the six ubiquitous virtues, so we decided to analyze the data on the level of single strengths instead of on the level of factors. For an initial examination, we computed descriptive statistics of the self-rated character strengths. Furthermore, internal consistency coefficients (Cronbach's alpha) and correlations with students' age and sex were computed. Since we observed some age and sex differences in our variables of interest, we decided to control for the influence of these demographic variables in the further analyses. As a second step, we computed partial correlations between character strengths, positive classroom behavior, and school achievement, while controlling for students' age and sex. In addition, we computed hierarchical multiple regression analyses (controlling for age and sex in the first step) and tested the incremental effect (change in adjusted R^2) of the 24 character strengths entered in the second step. As a final step, we conducted mediation analyses to test the direct and indirect effects of character strengths on school success. The mediation model is displayed in **Figure 1**. Mediation analyses were conducted with the help of an SPSS macro using bootstrapping with $z = 5,000$ resamples to compute 99.6% confidence intervals (corrected for multiple comparisons) for the indirect effects (Hayes, 2013). Standardized values of all variables were used in the mediation analyses.

Results

Preliminary Analyses and Relationships between Character Strengths, Positive Classroom Behavior, and School Achievement

The results of the preliminary analyses are displayed in **Table 1**. Means for the VIA-Youth ranged between 3.31 (leadership) and 4.13 (gratitude), and were comparable to the means reported in Ruch et al. (2014b). Also in line with previous findings (Park and Peterson, 2006; Ruch et al., 2014b), there were no substantial correlations with age, and scores on kindness and appreciation of beauty and excellence were higher for girls than for boys. School

TABLE 1 | Means, standard deviations, internal consistency coefficients, correlations with students' age and sex of all variables, and correlations with positive classroom behavior and overall school achievement.

Variables	M	SD	α	r_{age}	r_{sex}	PCB	OSA
VIA-Youth scales							
Creativity	3.65	0.51	0.65	0.11	−0.19	0.13	0.22*
Curiosity	3.41	0.47	0.55	−0.07	−0.11	0.18	0.15
Open-mindedness	3.50	0.43	0.61	0.17	−0.03	0.18	0.20
Love of learning	3.59	0.60	0.77	−0.03	0.09	0.34*	0.33*
Perspective	3.57	0.52	0.72	0.08	0.13	0.32*	0.40*
Bravery	3.55	0.52	0.70	0.11	0.10	0.07	0.12
Perseverance	3.73	0.53	0.73	0.02	−0.03	0.40*	0.33*
Honesty	3.64	0.55	0.80	0.15	0.17	0.27*	0.26*
Zest	3.71	0.53	0.72	−0.03	−0.04	0.36*	0.24*
Love	4.01	0.49	0.66	−0.01	0.12	0.23*	0.14
Kindness	3.95	0.50	0.76	0.15	0.46*	0.16	0.21
Social intelligence	3.72	0.49	0.71	0.19	0.14	0.31*	0.32*
Teamwork	3.93	0.50	0.76	0.19	0.07	0.25*	0.25*
Fairness	3.51	0.49	0.62	0.08	0.13	0.24*	0.13
Leadership	3.31	0.61	0.77	0.05	−0.11	0.24*	0.35*
Forgiveness	3.90	0.56	0.71	0.01	0.15	0.23*	0.21
Modesty	3.46	0.43	0.51	−0.03	0.09	0.14	0.17
Prudence	3.40	0.51	0.63	0.04	0.01	0.34*	0.31*
Self-regulation	3.52	0.54	0.71	0.10	0.01	0.32*	0.26*
Beauty	3.75	0.63	0.77	0.10	0.35*	0.07	−0.03
Gratitude	4.13	0.45	0.72	−0.01	0.10	0.27*	0.23*
Hope	3.75	0.51	0.72	−0.03	−0.13	0.41*	0.33*
Humor	3.82	0.59	0.74	−0.13	−0.05	0.13	0.29*
Religiousness	3.90	0.80	0.88	0.11	0.01	0.14	0.01
Teacher ratings							
PCB	3.99	0.73	0.89	−0.12	0.27*	0.66*	
OSA	4.77	1.46		−0.22*	0.11		

N = 179. Age: 10–13 years. Sex: 1 = male; 2 = female. VIA-Youth - VIA Inventory of Strengths for Youth; Beauty - appreciation of beauty and excellence; OSA - overall school achievement; PCB - positive classroom behavior (Classroom Behavior Rating Scale). *p < 0.05 (Bonferroni corrected, one-tailed).

achievement was negatively correlated with age, and girls received higher ratings in positive classroom behavior than boys.

As shown in **Table 1**, 15 of the 24 character strengths were correlated with positive classroom behavior with the numerically highest coefficients being found for hope, perseverance, zest, love of learning, and prudence. Similarly, 14 of the 24 character strengths were related to teacher-rated school achievement. Perspective, leadership, perseverance, love of learning, hope, and prudence yielded the numerically highest coefficients. The significant correlations were exclusively positive. Multiple hierarchical regression analyses revealed that the 24 character strengths when added in a second step (after controlling for age and sex in the first step) explained 19.7% additional variance (adjusted R^2) in positive classroom behavior, $F_{change}(24,152) = 2.99$, $p < 0.001$, and 23.9% additional variance in overall school achievement, $F_{change}(24,152) = 3.47$, $p < 0.001$.

Positive Classroom Behavior as a Mediator of the Relationship between Character Strengths and School Achievement

Table 2 shows the results of the mediation analyses (Hayes, 2013). There were total effects for 14 of the 24 character strengths and for most of these (all except creativity and humor), there were indirect effects ($a \times b$), which means that the relationship between the character strengths and school achievement was mediated by positive classroom behavior. For perspective and leadership,

there was both an indirect and a direct effect. For the remaining character strengths, the results were consistent with a full mediation—there was only an indirect effect and no significant direct effect. Humor was the only character strength that yielded a significant direct effect, but no indirect effect. Thus, the positive relationship between humor and school achievement was not mediated by positive classroom behavior.

Summary of Results and Limitations

Study 1 was primarily designed to replicate previous findings by Weber and Ruch (2012), and to extend these findings by looking at whether positive classroom behavior mediates the link between character strengths and school achievement on the level of single strengths. We found that a large number of character strengths were linked to teacher-reported positive classroom behavior and school achievement, and that many of the relationships with school achievement were fully mediated by positive classroom behavior. Perspective, leadership, and humor (also) showed direct effects on school achievement, independent of positive classroom behavior.

The interpretation of these results is somewhat limited by the fact that the ratings of positive classroom behavior and school achievement were done by only one teacher, and at the same time. In consequence, the two ratings may be somewhat confounded. Also, we only assessed overall school achievement and we do not know how much emphasis the teachers put on academic

TABLE 2 | Results of mediation analyses for character strengths as predictors of overall school achievement with positive classroom behavior as mediator (controlling for age and sex).

			Total effect	Direct effect	Mediation by positive classroom behavior	Total R^2
	a	*b*	*c*	*c'*	indirect effect *a* × *b*	
Creativity	0.13	0.65*	0.23*	0.15	0.09	0.48*
Curiosity	0.18	0.66*	0.15	0.03	0.12	0.47*
Open-mindedness	0.18	0.65*	0.21	0.09	0.12	0.47*
Love of learning	0.33*	0.63*	0.35*	0.13	0.22[a]	0.48*
Perspective	0.33*	0.60*	0.40*	0.20*	0.20[a]	0.50*
Bravery	0.07	0.66*	0.12	0.07	0.05	0.47*
Perseverance	0.41*	0.64*	0.35*	0.08	0.26[a]	0.47*
Honesty	0.26*	0.65*	0.26*	0.08	0.17[a]	0.47*
Zest	0.35*	0.67*	0.24*	0.01	0.23[a]	0.46*
Love	0.22*	0.67*	0.14	−0.01	0.15	0.47*
Kindness	0.16	0.65*	0.22	0.12	0.11	0.47*
Social intelligence	0.31*	0.63*	0.32*	0.13	0.19[a]	0.48*
Teamwork	0.25*	0.65*	0.25*	0.09	0.16[a]	0.47*
Fairness	0.24*	0.68*	0.14	−0.03	0.16	0.46*
Leadership	0.24*	0.62*	0.34*	0.20*	0.15[a]	0.50*
Forgiveness	0.23*	0.66*	0.22	0.06	0.15	0.46*
Modesty	0.14	0.66*	0.17	0.08	0.09	0.47*
Prudence	0.35*	0.63*	0.33*	0.11	0.22[a]	0.47*
Self-regulation	0.31*	0.65*	0.26*	0.06	0.20[a]	0.47*
Beauty	0.07	0.68*	−0.03	−0.08	0.05	0.47*
Gratitude	0.26*	0.65*	0.23*	0.06	0.17[a]	0.46*
Hope	0.40*	0.64*	0.33*	0.08	0.26[a]	0.47*
Humor	0.13	0.64*	0.28*	0.20*	0.08	0.50*
Religiousness	0.14	0.68*	0.01	−0.08	0.09	0.47*

N = 179. Beauty - Appreciation of beauty and excellence. a—Direct effect of IV (character strength) on mediator (positive classroom behavior). b—Direct effect of mediator (positive classroom behavior) on DV (school achievement). c—Total effect of IV (character strength) on DV (school achievement). c'—Direct effect of IV (character strength) on DV (school achievement). a × b—Indirect effect of IV (character strength) on DV (school achievement) through proposed mediator (positive classroom behavior). [a]The 99.6% CI obtained for the indirect effect by bootstrapping did not include 0. z = 5000 bootstrap resamples. *p < 0.05 (Bonferroni corrected, one-tailed).

vs. non-academic subjects, when evaluating the students' overall school achievement. Even though it can be assumed that these ratings are valid, it would be desirable to obtain the actual grades and ratings of positive classroom behavior that several teachers have agreed on. Especially when studying the relevance of good character in secondary school classrooms, this would be desirable, since students are in touch with a broader group of teachers than they are in primary school. Looking at grades in academic and non-academic subjects separately would also help to better understand what potential mechanisms are involved in the association between character strengths, positive classroom behavior, and school achievement.

Study 2

Study 2 aims at extending the findings of Study 1 in three ways: (a) by studying students in secondary school, (b) by using a rating system for positive behavior that has been established in schools and reflects the perspective of several teachers, and (c) by studying associations with actual grades in both academic and non-academic subjects. We expect that the results of Study 1 will be replicated in Study 2, although different measures for both positive classroom behavior and school achievement are used.

We expect somewhat lower effect sizes, since previous research has shown that personality traits tend to play a stronger role in predicting achievement on the primary school level than on secondary school level (Poropat, 2009). Similarly, we expect the correlation between positive classroom behavior and school achievement to be somewhat lower, while still substantial. As a consequence, we also expect that there will be fewer character strengths showing an indirect effect on school achievement through positive classroom. More importantly, we expect stronger relationships for grades in academic than for grades in non-academic subjects, since character strengths should support achievement-related behavior especially in those subjects that require sustained effort and that are less dependent of a specific talent, such as musicality.

Method
Participants

The sample consisted of 199 German-speaking secondary school students (53.3% females) attending the seventh to ninth grade. 37.2% of the students attended a secondary school with basic requirements (qualifying them to begin an apprenticeship after graduation) and 62.8% attended a secondary school with augmented requirements (qualifying them to attend to higher education like university after graduation). Their mean age was 14.42 years (*SD* = 1.19; ranging from 12 to 17 years). The majority (76.4%) of participants were Swiss citizens (including dual citizens).

Instruments

We used the German version (Ruch et al., 2014b) of the *VIA-Youth* (Park and Peterson, 2006) to assess *self-reported character strengths*. In Study 2, the internal consistency coefficients of the 24 VIA-Youth scales yielded a median of $\alpha = 0.78$. Only one scale had an alpha coefficient below 0.65 (modesty: $\alpha = 0.64$) and 22 of the 24 yielded coefficients > 0.70.

The *positive classroom behavior teacher ratings* is a standard used by schools in Switzerland to describe positive behavior in the classroom. In this study, we used ratings of achievement-related (e.g., "works diligently and reliably") and social behavior ("is considerate toward other students"). The seven items that were rated on a 4-point response scale (from $1 =$ "inadequate" to $4 =$ "very good") showed a high content overlap with the items of the CBRS (Weber and Ruch, 2012). These ratings were given by the respective students' teachers collectively and discussed during a teacher meeting. We tested the dimensionality of the teacher ratings using principal component analysis. One eigenvalue exceeded unity (eigenvalues were 3.76, 0.85, 0.66, 0.60, 0.45, 0.35, etc.) and this first factor explained 53.7% of the variance. Parallel analysis (Horn, 1965) suggested unidimensionality as well. Corrected item-total correlations ranged from $r = 0.52$ to $r = 0.71$ (mean $r = 0.62$), and the ratings showed a high internal consistency in the present study ($\alpha = 0.85$). In the analyses, we consequently used a mean score across all seven items.

School achievement was operationalized by *students' grades* that were provided by the schools' administration offices. Grades were coded on a scale ranging from $1 =$ "inadequate" to $6 =$ "very good" (allowing for half points), with all grades of 4 and higher representing an evaluation of satisfactory achievement, and 3.5 and lower describing unsatisfactory achievement. We computed students' GPAs as an average across all academic subjects (mathematics, German, French, and English language, history, and science; i.e., excluding music, arts, and physical education). We also calculated an average across grades in mathematics and German language (MG), the two grades commonly considered most important, and an average for grades in non-academic subjects (NA; including art, music, and physical education).

Procedure

Data for this study were collected in 14 classrooms of four secondary schools in German-speaking Switzerland, which represented two different educational levels. After obtaining approval by the ethical committee of the philosophical faculty at the University of Zurich, schools were contacted and asked to participate. Students and, in case of participating students under the age of 14 years, also a parent or legal guardian gave active consent.

Classroom teachers were instructed on how to oversee the completion of the questionnaire and how to respond to questions. They read standardized instructions to the students who completed the self-report questionnaire (as part of a larger study) in the classroom setting. Students received written feedback on their individual rank order of character strengths and were provided with information on the meaning of the character strengths of the VIA classification. The schools' administrative offices provided students' grades (including the teacher ratings on positive classroom behavior) at the end of the school term,

which was a couple of weeks after the data collection had taken place.

Data Analysis

In preliminary analyses, we computed means and standard deviations for all assessed variables. In addition, internal consistencies (Cronbach's alpha) and correlations with age, sex, and school level (basic vs. augmented requirements). To address our research questions, we computed partial correlations (controlling for age, sex, and school level) of the 24 character strengths with positive classroom behavior, and three different indicators of school achievement: GPA, an average across grades in mathematics and German language (MG), and an average for grades in non-academic subjects (NA; including art, music, physical education). As a second step, we conducted mediation analyses to test the direct and indirect effect of character strengths on school success as a third step (see Study 1).

Results

Preliminary Analyses and Relationships between Character Strengths, Positive Classroom Behavior, and School Achievement

As shown in **Table 3**, means for the VIA-Youth ranged between 3.31 (leadership) and 4.19 (gratitude), and were comparable to the means reported in previous studies as well as in Study 1. There were only a few correlations with age, and scores on bravery, kindness, beauty, and religiousness were higher for girls than for boys. Teamwork, modesty, and hope were higher in students attending schools with augmented requirements, whereas religiousness was higher in students attending schools with basic requirements. Positive classroom behavior was positively correlated with age, and GPA was unrelated to age and sex. Both positive classroom behavior and GPA were higher for students attending schools with augmented requirements than for students attending schools with basic requirements. As some of the variables appeared to be affected by participants' demographics, we controlled for such influences in subsequent analyses.

Perseverance, social intelligence, prudence, self-regulation, and hope were positively correlated with teacher-rated positive classroom behavior (see **Table 3**). Notably more character strengths were positively associated with school achievement, as operationalized by the grade average across all academic subjects: Love of learning, perspective, perseverance, zest, forgiveness, prudence, gratitude, and hope. Correlations with the average of grades in mathematics and German language were similar (although non-significant for perspective, prudence and gratitude). None of the 24 character strengths correlated with grades in non-academic subjects (art, music, physical education), with zest yielding the numerically highest correlation coefficient ($r = 0.20$, $p = 0.004$).

Multiple hierarchical regression analyses revealed that the 24 character strengths when added in a second step (after controlling for age, sex, and school level in the first step), explained 7.3% additional variance (adjusted R^2) in positive classroom behavior, $F_{change}(24,170) = 1.92$, $p < 0.01$, 14.8% additional variance in GPA, which was computed across all academic subjects, $F_{change}(24,170) = 2.79$, $p < 0.01$, and 13.4% additional variance in Grades in mathematics and German language,

TABLE 3 | Means, standard deviations, internal consistency coefficients, correlations with students' age and sex of all variables, and partial correlations with positive classroom behavior and overall school achievement (controlling for students' age, sex, and school level).

Variables	M	SD	α	r_{age}	r_{sex}	r_{level}	PCB	GPA	MG	NA
VIA-Youth scales										
Creativity	3.55	0.58	0.79	−0.01	−0.02	−0.01	−0.06	0.02	0.00	0.07
Curiosity	3.42	0.54	0.73	0.01	0.05	0.05	0.06	0.19	0.18	0.07
Open-mindedness	3.50	0.52	0.77	0.17	−0.05	0.16	0.07	0.11	0.09	0.03
Love of learning	3.40	0.58	0.74	−0.05	0.17	0.06	0.14	0.25*	0.23*	0.04
Perspective	3.72	0.51	0.74	0.20*	0.11	0.15	0.17	0.21*	0.17	0.10
Bravery	3.69	0.56	0.77	0.17	0.28*	0.10	−0.01	0.01	−0.03	0.03
Perseverance	3.65	0.57	0.80	−0.01	−0.03	0.07	0.22*	0.27*	0.23*	0.14
Honesty	3.79	0.55	0.81	0.09	0.13	0.08	0.18	0.14	0.11	0.06
Zest	3.59	0.55	0.77	0.01	−0.05	0.19	0.13	0.22*	0.25*	0.20
Love	4.04	0.59	0.79	0.06	0.14	0.10	0.13	0.17	0.21*	0.12
Kindness	4.00	0.51	0.80	0.08	0.39*	0.04	0.01	0.02	0.02	0.03
Social intelligence	3.83	0.47	0.66	0.21*	0.09	0.19	0.21*	0.17	0.18	0.06
Teamwork	3.94	0.50	0.74	0.15	0.01	0.24*	0.14	0.11	0.14	0.16
Fairness	3.64	0.50	0.71	0.18	0.16	0.21	0.17	0.09	0.06	0.05
Leadership	3.31	0.66	0.84	0.18	−0.01	0.21	0.12	0.12	0.15	0.17
Forgiveness	3.69	0.67	0.80	0.00	−0.12	0.20	0.08	0.25*	0.26*	0.16
Modesty	3.58	0.50	0.64	0.14	0.02	0.25*	0.10	0.04	0.08	−0.05
Prudence	3.45	0.53	0.71	0.04	−0.15	0.15	0.23*	0.22*	0.12	0.00
Self-regulation	3.59	0.58	0.75	0.14	−0.14	0.11	0.24*	0.19	0.20	0.09
Beauty	3.54	0.70	0.80	0.14	0.40*	0.03	0.10	0.05	0.05	0.14
Gratitude	4.19	0.52	0.79	0.01	0.07	0.15	0.11	0.23*	0.20	0.14
Hope	3.92	0.56	0.82	0.25*	−0.06	0.30*	0.24*	0.33*	0.30*	0.18
Humor	4.05	0.61	0.84	0.17	0.15	0.06	−0.08	0.08	0.08	0.02
Religiousness	3.38	1.00	0.89	−0.12	0.33*	−0.31*	−0.02	0.06	0.06	0.13
Teacher ratings, grades										
PCB	3.24	0.37	0.85	0.28*	0.11	0.52*		0.55*	0.39*	0.18
MG	4.56	0.50		−0.15	0.12	0.09				
GPA	4.61	0.44		0.07	0.19	0.31*				
NA	5.06	0.32		−0.17	0.12	0.15				

*N = 199. Age: 12–17 years. Sex: 1 = male; 2 = female. School level: 1 = basic requirements; 2 = augmented requirements. VIA-Youth - VIA Inventory of Strengths for Youth; Beauty - appreciation of beauty and excellence; PCB - positive classroom behavior; GPA - grade point average (only academic subjects: mathematics, German, French, and English language, history, science); MG - average for grades in mathematics and German language; NA - grades in non-academic subjects (art, music, physical education). *p < 0.05 (Bonferroni corrected, one-tailed).*

$F_{change}(24,170) = 2.30$, $p < 0.01$. However, the 24 character strengths explained no significant amount of variance in grades in non-academic subjects beyond the influence of age, sex, and school level, $F_{change}(24,170) = 1.45$, $p = 0.09$.

Positive Classroom Behavior as a Mediator of the Relationship between Character Strengths and School Achievement

To test the direct and indirect effects of character strengths on school achievement (GPA across academic subjects), mediation analyses were conducted using the bootstrapping procedure suggested by Hayes (2013). **Figure 1** shows an illustration of the tested mediation model and results are displayed in **Table 4**.

As shown in **Table 4**, eight character strengths yielded total effects on school achievement, as operationalized by GPA (across academic subjects). Hope yielded both a direct effect and an indirect effect through positive classroom behavior, which is in line with a partial mediation. Perseverance and prudence yielded indirect effects without direct effects, which is in line with a full mediation of the relationship by positive classroom behavior, and there was an additional indirect effect for social intelligence and self-regulation. Love of learning and forgiveness yielded only a

direct effect, thus their relationship with school achievement was not mediated by positive classroom behavior.

General Discussion

The present study extends the knowledge on the role of character strengths for positive behavior and achievement at school. We used two different samples to replicate and extend previous findings on the link between primary and secondary school students' character strengths, positive classroom behavior, and school achievement. Using a sample of primary school students, results of Study 1 showed that hope, perseverance, zest, love of learning, prudence, perspective and self-regulation were most substantially correlated with teacher-rated positive behavior in the classroom. Perspective, leadership, love of learning, perseverance, social intelligence, hope, and prudence yielded the highest correlations with overall school achievement, as rated by the students' homeroom teachers. For 12 of the 24 character strengths, mediation analyses revealed an indirect effect through positive classroom behavior on school achievement. Using a sample of secondary school students and actual grades, results of Study 2 showed that hope, self-regulation, prudence, perseverance, and

TABLE 4 | Results of mediation analyses for character strengths as predictors of GPA with positive classroom behavior as mediator (controlling for students' age, sex, and school level).

			Total effect	Direct effect	Mediation by positive classroom behavior	Total R^2
	a	*b*	*c*	*c'*	Indirect effect *a* × *b*	
Creativity	−0.04	0.56*	0.01	0.04	−0.03	0.39*
Curiosity	0.05	0.54*	0.17	0.14	0.03	0.41*
Open-mindedness	0.06	0.55*	0.10	0.07	0.03	0.39*
Love of learning	0.12	0.52*	0.24*	0.17*	0.06	0.42*
Perspective	0.15	0.53*	0.20*	0.12	0.08	0.40*
Bravery	−0.01	0.55*	0.01	0.02	0.00	0.39*
Perseverance	0.19*	0.51*	0.24*	0.15	0.10[a]	0.41*
Honesty	0.16	0.54*	0.13	0.04	0.08	0.39*
Zest	0.08	0.53*	0.21*	0.15	0.06	0.41*
Love	0.11	0.54*	0.16	0.10	0.06	0.40*
Kindness	0.01	0.55*	0.02	0.02	0.00	0.39*
Social intelligence	0.18*	0.54*	0.16	0.07	0.10[a]	0.39*
Teamwork	0.12	0.55*	0.10	0.03	0.07	0.39*
Fairness	0.15	0.55*	0.09	0.01	0.08	0.39*
Leadership	0.11	0.55*	0.11	0.06	0.06	0.39*
Forgiveness	0.07	0.54*	0.23*	0.20*	0.04	0.43*
Modesty	0.08	0.55*	0.04	−0.01	0.05	0.39*
Prudence	0.20*	0.53*	0.20*	0.10	0.11[a]	0.40*
Self-regulation	0.21*	0.54*	0.18	0.07	0.11[a]	0.39*
Beauty	0.09	0.55*	0.05	0.00	0.05	0.39*
Gratitude	0.09	0.53*	0.21*	0.16	0.05	0.41*
Hope	0.21*	0.50*	0.32*	0.22*	0.10[a]	0.43*
Humor	−0.07	0.56*	0.07	0.11	−0.04	0.40*
Religiousness	−0.02	0.55*	0.06	0.07	−0.01	0.39*

N = 199. Beauty - Appreciation of beauty and excellence. a—Direct effect of IV (character strength) on mediator (positive classroom behavior). b—Direct effect of mediator (positive classroom behavior) on DV (school achievement). c—Total effect of IV (character strength) on DV (school achievement). c'—Direct effect of IV (character strength) on DV (school achievement). a × b—Indirect effect of IV (character strength) on DV (school achievement) through proposed mediator (positive classroom behavior). [a]The 99.6% CI obtained for the indirect effect by bootstrapping did not include 0. *p < 0.05 (Bonferroni corrected, one-tailed).

social intelligence were related to positive classroom behavior, that eight character strengths were related to GPA across academic grades, and that none of the character strengths was correlated with grades in non-academic subjects. Mediation analyses revealed that the associations with GPA were (partly) mediated by positive classroom behavior for some of the character strengths, but not for others.

There were some striking similarities in the results of both studies. In both studies, perseverance, social intelligence, prudence, self-regulation, and hope were related to positive classroom behavior, and love of learning, perspective, perseverance, zest, prudence, gratitude, and hope were related to school achievement. Compared to typical effect sizes for the relationship between personality traits and academic achievement, the effect sizes that we found for several character strengths are comparable to or exceed those reported for conscientiousness in meta-analyses (cf. Poropat, 2009).

Perseverance, prudence and hope were associated with both positive classroom-behavior and school achievement across the two studies presented here. Social intelligence and self-regulation showed replicable associations across both samples only with positive classroom behavior, but were not related consistently with school achievement. Love of learning, perspective, zest and gratitude showed a replicable association with school achievement, but were not consistently associated with positive classroom behavior. When comparing these results to our expectations, eight of the

nine character strengths showed the expected associations with school achievement and/or positive classroom behavior across both studies. The ninth strength, teamwork, only showed associations with both variables in Study 1, but not Study 2. In addition, zest was robustly associated with school achievement. While love of learning is specifically related to positive experience while learning new things, zestful students are generally more vital, alert and energetic (cf. Peterson and Seligman, 2004). Zest is highly related to experiencing positive affective states in general (e.g., Van Eeden et al., 2008), but also at school (Weber et al., 2014). This suggests that being zestful is a helpful resource also for school achievement, e.g., by maintaining high levels of energy when being faced with schoolwork.

All character strengths that yielded indirect effects on school achievement through positive classroom behavior in Study 2 (perseverance, prudence, self-regulation, hope) had also yielded indirect effects in Study 1. Hope additionally yielded a direct effect on school achievement in Study 2. The effects of perseverance and prudence on school achievement were fully mediated by positive classroom behavior in both studies. Perseverance and prudence thus seem to be related to school achievement mostly through mechanisms that are observed and appreciated by the teachers. This seems plausible as both of these strengths are theoretically linked with adherence to rules and conforming with expectations, while controlling impulses and feelings that are repugnant to those. Hope, on the other hand, seems to affect school

achievement also through mechanisms that are not captured by teacher-rated positive classroom behavior.

There were also differences between the results of the two studies. Most strikingly, the number of character strengths associated with positive classroom behavior and (potentially as a consequence) the number of character strengths whose effects on school achievement were mediated by positive classroom behavior was much higher in the sample of primary school students (Study 1) than in the sample of secondary school students (Study 2). This cannot be explained by differences in sample sizes, which were minor anyway. Study 2 also showed that there were no relationships with grades in non-academic subjects. It is possible that specific talents (e.g., musicality, sportiness) play a more important role for achievement in such subjects. This result also suggests that character strengths are (at least not only) related to school achievement because "being the nice student" will make the grade in just any subject. It seems rather that character strengths facilitate achievement-related behavior that then may lead to better school achievement. The fact that Study 1 considered teacher ratings of overall school achievement which also included non-academic subjects might also account for a portion of the differences in the results between the two studies.

Limitations and Future Research

In the two studies, we used slightly different measures of positive classroom behavior and school achievement. While this can be seen as supporting the robustness of the findings, one could also argue that this makes the results less comparable. Indeed, it is difficult to disentangle which of the differences between the results are accounted for by sample characteristics (age, school type) or by differences in the measures. However, especially the measures of positive school behavior showed a high content overlap and teacher ratings of school achievement at primary school level have been shown to be highly related with actual grades (e.g., $r = 0.88$ in Spinath and Spinath, 2005).

The interpretation of our findings is of course also limited by the cross-sectional nature of the study, which does not allow drawing causal conclusions. While in many cases it seems likely that the character strength contributes to school achievement, in other cases also an opposite influence seems plausible (e.g., gratitude). In order to test such hypotheses, multiple-wave longitudinal studies are needed. It would also be informative to include measures of intelligence in future studies. Although it seems that variance in school achievement explained by personality is largely independent of the variance explained by intelligence, intelligence does play an important role in predicting school achievement, and should not be neglected. It might be especially interesting to study interactions of character strengths and intelligence in predicting academic outcomes.

Both types of teacher ratings that we used to measure positive classroom behavior encompass aspects of positive achievement-related behavior (e.g., behaving diligently) as well as positive social behavior (e.g., showing appropriate conflict management). These two aspects are not clearly separable in the ratings that were used here, and factor analyses clearly suggested a one-factor-solution. This may also be due to the fact that the majority of the items covered achievement-related behavior. However, it might

be informative to further develop those ratings to measure the two aspects separately and better understand whether positive classroom behavior is indeed unidimensional or whether it can also be conceptualized in a multidimensional way. With a multidimensional assessment of positive classroom behavior, perhaps additional strengths could emerge as predictors or as stronger predictors of positive classroom behavior.

Similarly, other types of academic outcomes besides grades might be investigated in future studies. For instance, results by Kappe and van der Flier (2010) revealed that the predictive validity of the Big Five personality factors on academic performance varied to some extent with the type of academic outcome (i.e., grade, exam result, essay, team project, or thesis) considered. We would expect certain character strengths to be more strongly related with specific types of academic outcomes than others (e.g., other-directed strengths such as teamwork or fairness should be more strongly related to performance in team projects than in exams).

We also believe that studying the relationship of character strengths with other desired and important outcomes in the classroom, such as positive relationships with teachers and with peers, deserves more empirical attention (cf. Quinlan et al., 2015). For a number of character strengths, we speculated that positive relationships in the classroom might be mechanisms by which they might influence behavior and success at school. A promising direction for further research might be to contrast different potential mediators to understand the effects of different character strengths in and outside the classroom better. Our results underline the importance of positive behavior in the classroom as a mediator, but for many of character strengths the effect on school achievement was not completely or at all attributable to differences in positive classroom behavior (e.g., perspective, leadership, and humor in Study 1, and love of learning, perspective, zest, forgiveness, gratitude, and hope in Study 2). Weber et al. (2014) suggested school-related positive affect as a mediator between certain affect-favoring character strengths (zest, perseverance, love of learning, social intelligence), positive school functioning, and school achievement. Including such dimensions of positive experiences, together with variables on the relationships in the classroom, variables assessing cognitive and motivational processes (e.g., achievement goals), and positive classroom behavior, could help determine which are the most relevant mechanisms of each of the character strengths associated with school achievement.

Conclusion

Taken together, results of the two studies reported here and in previous studies (Weber and Ruch, 2012) suggest a rather distinct set of strengths that seem to be most relevant in school. We found it interesting that these are not part of the same factor nor belong to the same virtue. In fact, strengths from four of the five factors reported in Ruch et al. (2014b) were among those consistently correlated with school achievement, positive classroom behavior, or both. However, the present findings hint at the existence of differences in the composition of this set of strengths, depending on the age, the school type, and also the type of outcome studied. Those moderators are not well understood yet. Additionally, an

interesting direction for future research would be investigating the application of different character strengths in the classroom. Especially since many interventions build on the application of signature strengths, it would be interesting to see whether findings on the application of character strengths in the workplace (cf. Harzer and Ruch, 2013) would generalize to the classroom. A first question would be whether those strengths that yield relationships with desired classroom outcomes such as school achievement are also perceived to be most desirable at school by both students and teachers. Second, it would be interesting to study whether the number of signature strengths a student applies in school is also associated with satisfaction and achievement at school. It is an ongoing debate whether interventions should rather target specific strengths that are seen as most relevant in the school context, or whether they should encourage the identification and application of the individual student's set of signature strengths (cf. Linkins et al., 2015), and potentially also encourage schools to provide opportunities to apply strengths that are not usually seen as relevant for school. In any case, this would have important implications for strength-based interventions.

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To schedule or not to schedule? Agentic and cooperative teams at call centers

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Work at call centers is often designed around technical solutions that imply some type of work schedule—every second that an agent is not on the phone amounts to precious queue time that must be managed (Durrande-Moreau, 1999). Even activities such as coffee brakes are scheduled (Garcia et al., 2012) and most call centers define a minimum percentage of the scheduled "time on the phone" (Garcia and Archer, 2012). This type of work design might imply unfavorable working conditions for employees, which in turn affect well-being, learning, and how agents cope with the rapid external and internal changes in working life. Indeed, performance at call centers (measured as the percentage of time on the phone/scheduled phone-time) has been shown to be negatively related to important work climate aspects (e.g., sense of autonomy and responsibility, relation with managers and colleagues; Garcia and Archer, 2012), employees' view of how successful the organization is in reaching its core values (e.g., communal values such as helpfulness toward the customer or colleagues; Garcia and Archer, 2012), and also employees' well-being (e.g., positive affect, life satisfaction). Scheduling agents' time on the phone might also limit their ability to work efficiently within the allocated working time (i.e., performance), probably because the amounts of incoming calls are completely outside the leaders' or employees' control—a common characteristic of workplaces in which services are delivered by phone (Ryan and Ployhart, 2003). A work situation with high demands and low freedom, through rigorous control of working procedures, creates a feeling of lack of control which can cause mental overload, in turn, leading to mental and physical health problems. Moreover, the low level of responsibility that is also common in call centers (e.g., employees do not need or are not expected to make decisions to improve services), along the lack of environmental control and performance monitoring, might influence agents to become passive (Karasek, 1979) and disempowered (Archer et al., 2014; Jimmefors et al., 2014).

Recently, together with our colleagues we have also found that individuals' communal character traits (i.e., the tendency to care and help others and being tolerant and empathic) are negatively associated to performance at call centers over a 6-month period. In other words, call centers seem to indeed disempower workers by scheduling every single task and by individualizing the way performance is measured, which diminishes their sense of autonomy and responsibility (i.e., agency or Self-directedness) and helpful behavior, social tolerance and empathy (i.e., communion or Cooperativeness). This is extremely counterproductive; especially in light of what call centers' agents state is the most positive factor in their work environment: their colleagues. **Figure 1**, for instance, shows a word cloud of the most common used words by 368 call center employees (unpublished data retrieved from Garcia and Archer, 2012) when describing positive things with their workplace (the size of the words corresponds to how often the word co-occurs in the text generated by the agents). In contrast to this notion, our results showed that call center agents with high levels of self-control and low levels of communal values are the ones performing the highest in this work environment. In most recruitment situations the main focus is to match the individual to the task or work environment (e.g., Garcia et al., 2014). Although this recruitment practice is somewhat appropriate, when applied in the recruitment of call center agents it might lead to recruitment of personnel high in self-control and low in cooperation. In other words leaving out workers that are high in agentic and communal core values (i.e., responsibility and cooperation).

Moreover, when groups and goals are shaped in an organization, it is easy for managers and employees to think "input-output models," for example, assume that homogeneity (i.e., all members of the group have similar characteristics or competencies) leads to higher performance (Wageman, 2001). Both leaders and co-workers think that other co-workers who are perceived as being of one's own "kind" raise the groups' competence (Wageman, 2001). However, having an extremely skilled team in which individuals are as capable or even overqualified for the task will not lead to any improvement in performance (Wageman, 2001).

In this opinion article, we propose the concept of self-managing teams

FIGURE 1 | Call center agents' (*N* = 368; see Garcia and Archer, 2012) statements of the most positive with their work depicted as a word cloud (created with www.wordle.net). Note: The words were translated from Swedish to English. The font size is proportional to the frequency of the word, the most frequent the word is in the statements the bigger font size.

(Hackman, 1987, 1990) as an alternative work design for call centers. As is common for work teams, the structure and purpose of a self-managing team is decided by others (e.g., customers, leaders), however, self-managing teams have the authority and accountability for not only executing the task but also monitoring and managing work processes—initiating changes in pace or procedure as needed. It is our opinion that such work design leads to the internalization and/or exploitation of agentic and communal values that positively influence workers' well-being and performance, thus, empowering the individual and the organization. Empowerment implies the capacity for self-awareness and knowledge together with the power and strength to take responsibility (Garcia et al., in review); these attributes are associated with the ability to make the right decisions regarding different aspects of one's and others' well-being (Garcia et al., in review). Well-being in this context refers to feeling good (i.e., happiness), doing good (i.e., mature and actively virtuous living), physical health (i.e., absence of disease or infirmity), and prosperity (i.e., success, good fortune, and flourishing), see Cloninger (2004, 2013).

In general, in a goal-oriented organization, the following "must" work: (1) the individual or group must actually perform the work, (2) the individual or group must monitor and take care of the work and if necessary also do change in work rate or strategy, (3) the individual or group must organize the group and its environment (e.g., by assigning the task, arranging support and resources within the organization) and finally, (4) an individual or group must specify the objectives to be achieved (Hackman, 1987). A self-managing group has the authority and responsibility for the first two "must" (i.e., carry out the work, monitor/follow-up and take care of the work), but within certain parameters and objectives decided by others. Consequently, a group's level of empowerment in this two "must" is what defines it as a self-managed group or not.

The notion of self-managing teams might be useful because research on how leaders and groups interact shows that the group's performance is affected by three factors: (a) the degree of effort members of the group spend together to perform the work, (b) how well suited the group's performance strategy is to the task, and (c) the amount of knowledge and skills that members bring with them to carry out the task (Wageman, 2001). In practice this means that the level of limitation a work group has, in these three factors, influences different mechanisms at group and individual levels, which either lowers or raises the group's performance. The leader's ability to influence the group's effort will in turn be related to his or her ability to control over what circumstances might limit these three performance factors (Hackman and Wageman, 2005). In other words, a leader who cannot or do not engage in these factors will fail in her/his attempts to improve group performance. The more influence a group or leader has on these factors should affect work performance because the individual might experiencing a higher degree of control and responsibility over her/his own work and also higher trust in others. The number of incoming calls is,

however, a huge restriction on the group and leaders of a call center, because the calls are largely beyond their control. Also, the competence of the group is limited by the task it self. Many call centers have simple tasks or personnel who are overqualified; both of these conditions limit either agents' opportunities to develop or has little influence on agents' performance (e.g., Swaab et al., 2014). Having opportunities to develop is, for instance, a predictor of well-being (i.e., positive and negative affect, life satisfaction, psychological well-being) and performance (i.e., percentage of time on the phone) among call center agents. Hence, it may be more effective to focus on the conditions that make it easier for groups to find the most appropriate strategy to solve the task. That is, making them self-managing.

Of course there are circumstances in which the group can influence the individual to perform more. Besides the size of the group (4–7 members is optimal according to Wageman, 1995), it is important that a self-managing team (I) has a clear direction and a clear objective of what should be done but not how, (II) has an optimal variety of skills relevant to the objective, (III) has an objective that allows or influence members to work together to manage it, (IV) has objective performance goals that requires effort, exceeding previous goals with specific deadlines and feedback if the goal has been reached or not, and (V) sets up strategic explicit norms or rules by convening meetings to solve problems, taking initiative for change in work habits, experimenting with new approaches, taking in good habits practiced by other groups, initiating solutions

to problems, and discussing individual responsibility and contribution.

Furthermore, the notion of self-managing teams involves agentic and communal values, thus, it might have repercussions for employees' well-being. This is important not only from a mental health perspective but also from a business perspective—employees who feel good or are happy (i.e., experiencing positive emotions more often than negative emotions in their workplace) infect their mood to others, such as colleagues and customers (Ryan and Ployhart, 2003). For instance, happy employees engage more often in pro-social behavior determined by the employer, such as sharing their knowledge with colleagues. The happy employee is more willing to help colleagues and customers beyond the employer's expectations (i.e., "going the extra mile," George, 1990). In other words, the implementation of self-managing teams as a work design practice in call centers might increase well-being, responsibility, and cooperation. The increasing of positive emotions among employees, in turn, reinforcing cooperation among team members and agents' helpful behavior toward customers; which increases productivity (Tjosvold et al., 2014). Nevertheless, it ought to be said that the link between happy employees/high performance is ambiguous. While public and private sector employees' positive emotions are related to work performance (Zelenski et al., 2008), this seems not to be the case among call center agents. Instead, it seems like thinking about their performance primes positive emotions among call center agents (Garcia et al., in press).

There are some indications from empirical research from Xerox Corporation's customer service department, various airline crews and IBM's programming team, suggesting that self-managing teams might have a place in the call center environment (for a review see Hackman and Wageman, 2005). Some of these organizations, although having similar purposes, have even more complex structure than most call centers. Xerox Customer Service Department, for example, is split into nine geographical areas, which in turn have subdivisions. Each subdivision is in turn composed of 5–10 teams in different cities, organized after the geography or the type of

machines to be serviced. A team's main tasks are to answer customer calls about engine failure and to perform site visits for hardware maintenance. The research conducted at Xerox's customer services department, shows that self-managed teams are more effective than control groups (see Hackman and Wageman, 2005). Nevertheless, most call centers still employ the conventional work design detailed at the beginning of this Opinion article.

Whether it's a social movement (e.g., Martin Luther King's struggle against racism in the US) or business success (e.g., Ingvar Kamprad's IKEA), the leader is always seen as the key factor that affects individuals' willingness to perform beyond the ordinary. The leader's ability to communicate the organization's vision, purpose and goals has been shown to have an impact on employees' level of stress (Den Hartog and Koopman, 2002). A leader's achievement is often attributed to their personality or even innate characteristics, rather than the circumstances or the nature of the strategic choices they make or choose (see for a critical review Bligh and Schyns, 2007). Although this is important, in this opinion article we have not focused on how much a leader can influence workers' performance. Instead, we have defined what conditions the leader should create for call center groups to work as self-managing groups and not merely as a set of individuals (see also Luria, 2008). More importantly, this notion might empower the individual, the team and the organization to feel good (i.e., happiness), do good (i.e., mature and actively virtuous living), physical health (i.e., absence of disease or infirmity), and prosperity (i.e., success, good fortune, and flourishing).

"I suppose leadership at one time meant muscles; but today it means getting along with people"
Mohandas Gandhi

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The relationships of character strengths with coping, work-related stress, and job satisfaction

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Personality traits have often been highlighted to relate to how people cope with stressful events. The present paper focuses on character strengths as positive personality traits and examines two basic assumptions that were derived from a core characteristic of character strengths (i.e., to determine how individuals deal with adversities): (1) character strengths correlate with coping and (2) buffer the effects of work-related stress on job satisfaction. Two different samples (i.e., a mixed sample representing various occupations [$N = 214$] and a nurses sample [$N = 175$]) filled in measures for character strengths, coping, work-related stress, and job satisfaction. As expected, intellectual, emotional, and interpersonal strengths were related to coping. Interpersonal strengths played a greater role for coping among nurses, as interactions with others are an essential part of their workday. Furthermore, intellectual strengths partially mediated the negative effect of work-related stress on job satisfaction. These findings open a new field for research on the role of personality in coping with work-related stress. Character strengths are trainable personal characteristics, and therefore valuable resources to improve coping with work-related stress and to decrease the negative effects of stress. Further research is needed to investigate this assumed causality.

Keywords: character strengths, coping, stress, job satisfaction, nurses, positive psychology

INTRODUCTION

Within the work-context, work-related stress is an issue with a strong impact on employees, organizations, and the communities (e.g., Vagg and Spielberger, 1998; Hodapp et al., 2005). Stress occurs when a person "is hard-pressed to deal with some obstacle or impediment or looming threat" (Carver and Connor-Smith, 2010, p. 684). Typical work-related stressors are, for example, workload, time pressure, and conflicts with co-workers (Vagg and Spielberger, 1998). Work-related stress often results in employee dissatisfaction, lowered productivity, absenteeism, and turnover (e.g., Landsbergis, 1988; Karasek and Theorell, 1990; Cooper and Cartwright, 1994). People cope with stress in different ways to prevent or diminish it directly (i.e., reduce the stressor) or indirectly (i.e., reduce associated distress; Carver and Connor-Smith, 2010). Personality traits have often been highlighted to relate to how people cope with stressful events (e.g., Grant and Langan-Fox, 2006; Connor-Smith and Flachsbart, 2007).

The present paper focuses on character strengths as positive personality traits. One of the core defining characteristics of character strengths is that they determine "how an individual copes with adversity" (Peterson and Seligman, 2004, p. 17). Hence, character strengths should (1) be directly related to coping behavior and (2) protect against the negative effects of work-related stress on job satisfaction like coping does (e.g., Kirkcaldy et al., 1995; Wolfgang, 1995). The present paper is aimed at examining whether empirical data support these two assumptions by studying the relationships between character strengths, coping behavior, work-related stress, and job satisfaction. If this is the case, then character

strengths, as trainable personal characteristics (Peterson and Seligman, 2004), might function as important resources for the training on and/or off the job in the future. Such training could improve coping with work-related stress in order to decrease the negative consequences of work-related stress for all – the employee, the organization, and the community. Moreover, we aimed at utilizing two samples. One of the samples should be comprised of employees from various occupations in order to study the relationships between the variables of interest on a more general level. The second sample should be a sample of nurses, because this is one of the occupational groups especially exposed to work-related stress, and where coping with stress plays an important role (e.g., Landsbergis, 1988; Greenglass and Burke, 2000). Utilizing these two samples would help to identify replicable relationships between character strengths and coping, but also to have a first insight in job-group specific associations.

CHARACTER STRENGTHS

Character strengths are positively valued, narrow personality characteristics (e.g., being friendly, honest, and/or persistent, appreciating excellent performances). According to Peterson and Seligman (2004), character strengths are trait-like and valued in their own right. They are not engaged in for the tangible outcomes they may produce, although character strengths do produce desirable outcomes. Character strengths manifest in individual behaviors (e.g., working well in a team), thoughts (e.g., looking positively ahead), and feelings (e.g., being grateful for getting a scholarship). They are seen as the inner determinant of a satisfied,

happy, and successful life (i.e., the good life), in addition to external factors like a good education, stable social environment, or financial security (cf. Peterson, 2006). Character strengths are considered to be the components of a positive, good character. For a comprehensive description of a positive, good character, Peterson and Seligman (2004) developed a catalog of 24 different character strengths – the Values in Action (VIA) classification (see **Table 1** for an overview and the definitions of the character strengths).

Research showed that the character strengths presented in **Table 1** do contribute to a good, satisfied, and successful life on and off the work-context. For example, the character strengths zest, hope, gratitude, curiosity, love, religiousness, and humor were the ones most robustly related to job satisfaction across job categories (e.g., professional, blue collar, and homemaker; Peterson et al., 2010). Furthermore, different character strengths were meaningfully associated with different work-related behavior. For example, perseverance, zest, and love of learning showed the numerically strongest relationships with career ambition, and employees with higher scores in the character strengths (e.g., hope, zest, bravery, and perspective) tended to have healthier work behavior (Gander et al., 2012). Harzer and Ruch (2014) reported various, replicable associations between character strengths and self- and supervisory ratings of different dimensions of job performance (i.e., task performance, job dedication, interpersonal facilitation, as well as organizational support). For example, task performance was related to perseverance, teamwork, honesty, prudence, and self-regulation. Interpersonal facilitation correlated with teamwork, kindness, leadership, and fairness.

The current "gold standard" of the subjective assessment of the 24 character strengths in adults is the Values in Action Inventory of Strengths (VIA-IS; Peterson et al., 2005). Independent from the original classification of character strengths (cf. **Table 1**), which was done theoretically, on a content-related basis, analyses of the factor structure of the character strengths in adults measured with the VIA-IS were computed (e.g., Peterson, 2006; Peterson et al., 2008; Brdar and Kashdan, 2010). Results differed with respect to the characteristics of (a) samples (e.g., adult volunteers vs. students), (b) data (i.e., absolute vs. ipsative [intra-individually standardized] scores), (c) version of the VIA-IS (e.g., original vs. items from the International Personality Item Pool by Goldberg), and (d) language (e.g., participants filled in the VIA-IS in their native language vs. foreign language; cf. Harzer, 2012). When examining absolute scores (utilizing principal component analysis with Varimax rotation) in non-student samples that filled in the original VIA-IS in a version of their native language, a five factor solution seemed to be the most appropriate one (no matter if data comes from self- or peer-ratings; e.g., Peterson et al., 2008; Ruch et al., 2010; Harzer and Ruch, 2014). These five factors could also be replicated across various German-speaking samples (e.g., Ruch et al., 2010; Proyer and Ruch, 2011; Güsewell and Ruch, 2012; Harzer and Ruch, 2014). The five factors were labeled as *emotional strengths* (also named strengths of fortitude; e.g., loaded by the character strengths bravery, zest, hope, honesty, perspective), *interpersonal strengths* (e.g., capacity to love and be loved, kindness, leadership, teamwork, humor; mainly a combination of interpersonal and civic strengths), *strengths of restraint* (also

labeled as temperance; e.g., prudence, forgiveness, fairness, modesty), *intellectual strengths* (also named cognitive strengths; e.g., creativity, curiosity, love of learning), *and theological strengths* (also labeled as transcendence; i.e., appreciation of beauty and excellence, gratitude, religiousness). The present paper focuses on these five factors rather than on 24 character strengths, in order to get a general overview on the relationships between character strengths and coping with stress.

Previous publications on cross-sectional data showed that character strengths are associated with dealing positively with trauma (Peterson and Seligman, 2003; Peterson et al., 2008) and with recovery from illness (Peterson et al., 2006). Especially, intellectual, emotional, and interpersonal strengths were related to dealing with adversity (i.e., trauma and illness). For example, intellectual and interpersonal strengths increased with the number of traumatic events experienced (e.g., life-threatening accident, sexual assault, and physical assault; Peterson et al., 2008). Furthermore, intellectual and emotional strengths tended to be more pronounced in those who had recovered from physical illness compared to those who did not recover (fully) or have not had an illness (Peterson et al., 2006).

The research presented so far shows that character strengths are associated with dealing positively with adversity. However, the relationships between character strengths and coping behavior have never been examined directly. The present paper, therefore, is aimed at examining the relationships between character strengths and coping behaviors to further investigate the role of character strengths in dealing with stress.

COPING WITH STRESS

This paper focuses on dispositional coping, which is defined as an individual's habitual way of reacting to stressors with certain coping mechanisms or strategies (i.e., the individual's characteristic reaction to stressful events; Janke et al., 1985; Janke and Erdmann, 2008). Janke and colleagues provided an extensive model of dispositional coping (e.g., Janke et al., 1985; Janke and Erdmann, 2008). They distinguish between 20 different coping modes, which in turn can be subsumed into two broad categories, namely positive and negative coping strategies (plus a group of four equivocal coping modes, which are not of interest here). *Negative coping strategies* (NEG) entail coping behaviors that do not reduce stress/strain in the long run but augment it (i.e., escape, social withdrawal, rumination, resignation, self-pity, self-blame). *Positive coping strategies* (POS) are assumed to reduce stress; they can be further separated into three subcategories. The first subcategory, called *devaluation/defense* (POS1), covers a cognitive way of coping and entails the coping modes minimization (of intensity, duration, or importance of stress), self-aggrandizement by comparison with others (i.e., attribute less stress to oneself than to others), and denial of guilt. The second one, *distraction* (POS2), is characterized by seeking distraction from strain by focusing on situations and states that are incompatible with stress. It entails the four coping modes distraction (i.e., focus the attention on something else), substitute gratification (i.e., turn to something positive), search for self-affirmation, and relaxation. *Control* (POS3) represents the third positive coping subcategory and entails the active control of stressors

Table 1 | The 24 character strengths included in the Values in Action classification of strengths (Peterson and Seligman, 2004) and short descriptions defining the strengths.

(1) Strengths of wisdom and knowledge (i.e., cognitive strengths that entail the acquisition and use of knowledge)

- *Creativity [originality, ingenuity]*: Thinking of novel and productive ways to conceptualize and do things; includes artistic achievement but is not limited to it
- *Curiosity [interest, novelty-seeking, openness to experience]*: Taking an interest in all of on-going experience for its own sake; finding subjects and topics fascinating; exploring and discovering
- *Judgment & Open-Mindedness [critical thinking]*: Thinking things through and examining them from all sides; not jumping to conclusions; being able to change one's mind in light of evidence; weighing all evidence fairly
- *Love of Learning*: Mastering new skills, topics, and bodies of knowledge, whether on one's own or formally; obviously related to the strength of curiosity but goes beyond it to describe the tendency to add systematically to what one knows
- *Perspective [wisdom]*: Being able to provide wise counsel to others; having ways of looking at the world that make sense to oneself and to other people

(2) Strengths of courage (i.e., emotional strengths that involve the exercise of will to accomplish goals in the face of opposition, external or internal)

- *Bravery [valor]*: Not shrinking from threat, challenge, difficulty, or pain; speaking up for what is right even if there is opposition; acting on convictions even if unpopular; includes physical bravery but is not limited to it
- *Perseverance [persistence, industriousness]*: Finishing what one starts; persisting in a course of action in spite of obstacles; "getting it out the door"; taking pleasure in completing tasks
- *Honesty [authenticity, integrity]*: Speaking the truth but more broadly and presenting oneself in a genuine way and acting in a sincere way; being without pretense; taking responsibility for one's feelings and actions
- *Zest [vitality, enthusiasm, vigor, energy]*: Approaching life with excitement and energy; not doing things halfway or half-heartedly; living life as an adventure; feeling alive and activated

(3) Strengths of humanity (i.e., interpersonal strengths that involve "tending and befriending" others)

- *Capacity to Love and Be Loved [short name: love]*: Valuing close relations with others, in particular those in which sharing and caring are reciprocated; being close to people
- *Kindness [generosity, nurturance, care, compassion, altruistic love, "niceness"]*: Doing favors and good deeds for others; helping them; taking care of them
- *Social Intelligence [emotional intelligence, personal intelligence]*: Being aware of the motives and feelings of other people and oneself; knowing what to do to fit into different social situations; knowing what makes other people tick

(Continued)

Table 1 | Continued

(4) Strengths of justice (i.e., civic strengths that underlie healthy community life)

- *Teamwork [citizenship, social responsibility, loyalty]*: Working well as a member of a group or team; being loyal to the group; doing one's share
- *Fairness*: Treating all people the same according to notions of fairness and justice; not letting personal feelings bias decisions about others; giving everyone a fair chance
- *Leadership*: Encouraging a group of which one is a member to get things done and at the same time maintain good relations within the group; organizing group activities and seeing that they happen

(5) Strengths of temperance (i.e., strengths that protect against excess)

- *Forgiveness & Mercy*: Forgiving those who have done wrong; accepting the shortcomings of others; giving people a second chance; not being vengeful
- *Modesty & Humility*: Letting one's accomplishments speak for themselves; not regarding oneself as more special than one is
- *Prudence*: Being careful about one's choices; not taking undue risks; *not* saying or doing things that might later be regretted
- *Self-Regulation [self-control]*: Regulating what one feels and does; being disciplined; controlling one's appetites and emotions

(6) Strengths of transcendence (i.e., strengths that forge connections to the larger universe and provide meaning; theological strengths)

- *Appreciation of Beauty and Excellence [awe, wonder, elevation; short name: beauty]*: Noticing and appreciating beauty, excellence, and/or skilled performance in various domains of life, from nature to art to mathematics to science to everyday experience
- *Gratitude*: Being aware of and thankful for the good things that happen; taking time to express thanks
- *Hope [optimism, future-mindedness, future orientation]*: Expecting the best in the future and working to achieve it; believing that a good future is something that can be brought about
- *Humor [playfulness]*: Liking to laugh and tease; bringing smiles to other people; seeing the light side; making (not necessarily telling) jokes
- *Religiousness & Spirituality [faith, purpose]*: Having coherent beliefs about the higher purpose and meaning of the universe; knowing where one fits within the larger scheme; having beliefs about the meaning of life that shape conduct and provide comfort

The character strengths are grouped together content-wise on a theoretical basis.

and reactions. The related coping modes are situation control (i.e., analyze, plan, and act for control and problem solving), reaction control (of own responses), and positive self-instructions (i.e., to accredit oneself competence and the ability to control).

Research that underlined the validity of the distinction between positive coping as being adaptive, and negative coping as being maladaptive was mainly conducted in the clinical setting (e.g., Grüsser et al., 2006; Möller-Leimkühler, 2006). Research conducted in the work-context showed that higher scores in negative coping predicted lower novices' performance in surgery (Hassan et al., 2006; Maschuw et al., 2011).

CHARACTER STRENGTHS AND COPING WITH STRESS

Given the results of previous research on the relationships of character strengths with recovery from illness and trauma, it was expected that especially intellectual, emotional, and interpersonal strengths relate to dispositional coping behavior. There should be a direct relation with positive coping strategies (i.e., positive correlations) and an inverse relation for negative coping strategies (i.e., negative correlations). This was expected, because it was postulated that character strengths contribute to individual fulfillment (cf. Peterson and Seligman, 2004; Peterson, 2006). Therefore, character strengths should be positively related to positive, stress-reducing coping, and negatively to negative, not stress-reducing coping.

More specific hypotheses on the relationships between character strengths and coping were formulated content-driven. *Intellectual strengths* foster the production of new and reasonable strategies for problem solving and the exploration of situational circumstances (e.g., being curious and thinking creatively). This analytical behavior should assist in the learning process regarding what will help to reduce stress and what will not. The following hypothesis was therefore proposed:

Hypothesis 1: Intellectual strengths correlate positively with every subcategory of stress-reducing coping (i.e., [a] POS1, [b] POS2, and [c] POS3).

Emotional strengths include active behaviors (e.g., being brave, persistent, and hopeful, having perspective), which should be beneficial for behaviors associated with control (POS3; i.e., analyzing the situation, problem solving, controlling own reactions, and facing a stressful event), rather than engaging in more passive devaluation/defense (POS 1) and distraction (POS 2). Emotional strengths are therefore expected to show stronger relations to the positive coping strategy control (POS3) compared to the strategies devaluation/defense (POS1) and distraction (POS2).

Hypothesis 2: Emotional strengths correlate more strongly with control (POS3) than with (a) devaluation/defense (POS1) and (b) distraction (POS 2).

Interpersonal strengths might be especially helpful in dealing positively with stressors in social interactions. Interpersonal strengths might, therefore, play a special role in jobs with a high rate of social interactions (e.g., teachers, nurses, sales persons). Nurses are one of those occupational groups working in a job that is known to

be very stressful and where coping with stress plays an important role (e.g., Landsbergis, 1988; Greenglass and Burke, 2000). An often-observed stressor for nurses is the (sometimes) problematic contact with doctors as well as patients and their relatives (e.g., Harris, 1989; Burgess et al., 2010). Hence, interpersonal strengths are expected to be stronger related to coping in nurses than in a mixed sample of employees because interpersonal strengths help to deal with interpersonal conflicts or might even prevent them. The role of interactions with others levels out in mixed samples, and hence the role of interpersonal strengths levels out.

Hypothesis 3: Interpersonal strengths correlate more strongly with positive coping (POS) in a sample of nurses than in a mixed sample.

CHARACTER STRENGTHS, STRESS, AND JOB SATISFACTION

If character strengths are indeed related to coping, they should also buffer the negative effects of work-related stress on job satisfaction. Studies showed that character strengths are positively related to job satisfaction (e.g., Peterson et al., 2010; Gander et al., 2012). So far, it is not known how character strengths relate to stress at work. However, it has been shown that character strengths buffer the negative effects of an illness on life satisfaction (Peterson et al., 2006). These findings indicated that character strengths might increase with the challenges experienced (e.g., illness, trauma), which in turn are positively related to life satisfaction. Based on those results, it is expected that character strengths might buffer the negative effect of work-related stress on job satisfaction (cf. Landsbergis, 1988; Wolfgang, 1995). It can be expected, that character strengths might profit from the challenges provided by work-related stress. Facing challenges could be seen as a natural learning environment to enhance character strengths, because behavior related to the character strengths might be beneficial in solving the challenges successfully. Therefore, a positive relationship between character strengths and frequency of work-related stress was expected. Fostering character strengths should in turn enhance job satisfaction, and therefore, a (partial) mediation of the negative relationship between frequency of work-related stress and job satisfaction by character strengths was expected.

Nevertheless, a moderation effect might occur as well; that is, character strengths might influence the relation between work-related stress and job satisfaction. For people with high scores in character strengths, work-related stress might have a smaller impact on job satisfaction than for people low in character strengths. Therefore, the mediation and the moderation effect of character strengths on the relationship between work-related stress and job satisfaction was examined. The following, explorative hypotheses were formulated:

Hypothesis 4 (explorative): Character strengths mediate the relationship between the frequency of work-related stress and job satisfaction.

Hypothesis 5 (explorative): Character strengths moderate the relationship between the frequency of work-related stress and job satisfaction.

AIMS OF THE PRESENT STUDY

The present study had two main aims. Firstly, this study was aimed at investigating the relationships between character strengths and coping in a mixed sample with employees from different occupations and in a sample with nurses. Utilizing the two samples would help to identify replicable relationships between character strengths and coping, but also to have a first insight in job-group specific associations. Analyses will be done on the level of character strengths factors (i.e., emotional strengths, interpersonal strengths, strengths of restraint, intellectual strengths, and theological strengths) and coping strategies (i.e., negative coping and positive coping as well as the three subcategories of positive coping: devaluation/defense, distraction, and control). Secondly, it will be examined whether character strengths mediate and/or moderate the relationship between work-related stress and job satisfaction.

MATERIALS AND METHODS

PARTICIPANTS

Sample 1 (mixed sample)

The sample consisted of 214 German-speaking adult volunteers (71 men, 143 women). Their mean age was 38.28 years ($SD = 10.51$; range: 21–64 years). Most of the participants were married ($n = 90$) or in a relationship ($n = 55$), $n = 53$ were single, $n = 12$ were separated or divorced, and $n = 4$ were widowed. Participants were highly educated, as $n = 120$ indicated having a Master's degree, $n = 37$ a doctor's degree; $n = 32$ had an apprenticeship, $n = 12$ had a school diploma, and $n = 13$ had completed secondary school. Participants represented a wide array of occupations (e.g., office workers, teachers, and researchers). Participants at least worked 50% of full time hours with two third of them working 100% (full-time; $M_{\text{percentage of employment}} = 88.33\%$, $SD = 18.73$).

Sample 2 (nurses sample)

The sample consisted of 175 German-speaking hospital nurses (11 men, 164 women; representing the typical gender ratio in this occupation) from different hospitals. Their mean age was 40.16 years ($SD = 10.06$; range: 21–61 years). Most of the participants were married ($n = 76$) or in a relationship ($n = 47$), and $n = 33$ were single, $n = 17$ were separated or divorced, and $n = 2$ were widowed. Concerning educational level, $n = 123$ had an apprenticeship, $n = 32$ had a Master's degree, $n = 13$ had completed the secondary school, $n = 6$ had a school diploma allowing them to attend university, and $n = 1$ had a doctor's degree. Participants at least worked 50% of full time hours with two third of them working 80% ($M_{\text{percentage of employment}} = 83.19\%$, $SD = 16.04$; range: 50–100%).

The two samples did not differ with respect to age ($t[387] = -1.79$, $p = 0.074$) and marital status ($\chi^2[4] = 4.12$, $p = 0.390$) but in gender ratio ($\chi^2[1] = 41.85$, $p < 0.001$), education ($\chi^2[5] = 138.34$, $p < 0.001$), and percentage of employment ($t[386.16] = 2.92$, $p = 0.004$). Sample 1 (mixed sample) entailed more males, was better educated, and had a higher percentage of employment than sample 2 (nurses sample). Therefore, gender, education, and percentage of employment were controlled in all subsequent analyses.

INSTRUMENTS

The *Values in Action Inventory of Strengths* (*VIA-IS;* Peterson et al., 2005) is a questionnaire consisting of 240 items in a 5-point Likert-scale answer format (from 1 = *very much unlike me* through 5 = *very much like me*) measuring the 24 character strengths of the VIA classification (10 items per strength, responses are averaged to compute the scale scores). A sample items is "I never quit a task before it is done" (perseverance). The VIA-IS has widely been used in research (e.g., Brdar and Kashdan, 2010; Harzer and Ruch, 2012; Littman-Ovadia and Lavy, 2012; Proyer et al., 2013a). The German version of the VIA-IS (Ruch et al., 2010) showed high internal consistencies (median $\alpha = 0.77$) and high stability over 9 months (median test–retest correlation = 0.73). Self- and peer-rating forms correlated in the expected range (median correlation = 0.40). In the present study, internal consistencies had a median of 0.78 and 0.74 in sample 1 (mixed sample) and 2 (nurses sample), respectively. The 24 VIA-IS scales were reduced to five strengths factors (i.e., emotional strengths, interpersonal strengths, strengths of restraint, intellectual strengths, and theological strengths) by principal component analysis, subsequent Varimax rotation, and saving the factor scores for further analyses. The factor analysis resulted in five factors that were highly similar to the solution reported by Ruch et al. (2010). The Tucker's phi coefficients for the corresponding factors ranged from 0.91 to 0.99.

The *Stress Coping Inventory* (*SVF120;* Janke and Erdmann, 2008) is a questionnaire in German language consisting of 120 items in a 5-point Likert-scale answer format (from 0 = *not at all* through 4 = *very likely*) measuring dispositional coping. Sample items are "I plan how to solve the difficulties involved" (situation control). Scores can be computed for 20 coping strategies (i.e., modes measured with six items each, responses are summed up to compute the scale scores), which can be subsumed to two broad categories (i.e., positive strategies [average score of 10 modes] and negative strategies [average score of 6 modes]) and a group of equivocal modes (4 modes). The positive strategies can be separated into the subcategories devaluation/defense, distraction, and control (i.e., average score of three to four modes each). The SVF120 (modes and [subcategories of] strategies) showed to be reliable (median $\alpha = 0.84$), stable (median test–retest correlation = 0.77), and construct valid (e.g., factorial structure; convergent and discriminant validity; Trempa et al., 2002; Janke and Erdmann, 2008). The SVF120 has been used widely in research (e.g., Möller-Leimkühler, 2006; Maschuw et al., 2011). In the present study, internal consistencies of the 20 coping modes had a median of 0.82 in each of the two samples.

The *Job Stress Survey* (*JSS;* Spielberger and Vagg, 1999) is a questionnaire assessing the frequency (1 = *never* to 9 = *all the time* experienced during the last 6 months) and perceived severity (1 = *least stressful* to 9 = *most stressful*) of 30 job-related events that are stressful for employees in a variety of occupations. Sample stressors are "meeting deadlines," "excessive paperwork," and "poorly motivated co-workers." The German version of the JSS showed high reliability ($\alpha \geq 0.92$) and factorial validity (Hodapp et al., 2005). The JSS has widely been used in research (e.g., De Fruyt and Denollet, 2002; Bongard and al'Absi, 2005; Lau et al.,

2006). In the present study, the JSS frequency scale was of interest (computed by averaging the frequency ratings of the 30 stressful job-related events). Its internal consistency was 0.92 in sample 1 and 0.90 in sample 2.

The *Index of General Job Satisfaction* (*GJS*; Fischer and Lück, 1972) is a questionnaire in German language and measures job satisfaction very broadly. It consists of two items, which do not relate to specific aspects of a job (i.e., "I really enjoy my job"; "What do you think: overall, would you say your job is really interesting and satisfying"). Answers are given on a 5-point Likert-scale (from 1 = *untrue* through 5 = *true*). Inter-item correlation is 0.47 (Fischer and Lück, 1972). This measure was chosen to prevent content overlap and inflated correlations with the JSS; more detailed job satisfaction measures ask for similar topics. In the present study, inter-item correlations were 0.68 and 0.69 in sample 1 (mixed sample) and 2 (nurses sample), respectively. Responses were averaged to compute the scale score for job satisfaction.

PROCEDURE

Sample 1 (mixed sample) was recruited in several ways to obtain a heterogeneous sample (e.g., flyer distributed in city center, snowball system via email and social networks). Sample 2 (nurses sample) was recruited via information on the Website of the Swiss professional association of nurses and via press coverage in a journal for nursing. The only requirement for participation was to work at least 50% of full time hours. All participants completed the questionnaires and provided information on demographics via the Internet. Respondents were not paid for participation, but were given a feedback of individual results.

RESULTS

DESCRIPTIVE STATISTICS FOR THE MEASUREMENTS (VIA-IS FACTORS, SVF-120 STRATEGIES, JSS, AND GJS) IN THE TWO SAMPLES

For an examination of the measurements, mean, standard deviation, skewness, and kurtosis were computed for all scales in each of the two samples. Furthermore, reliability analyses (Cronbach's alpha) were conducted (see **Table 2**).

Table 2 shows that skewness and kurtosis indicated normal distribution of all scales in both samples. Standard deviation showed the tendency to be smaller in the more homogeneous sample 2 (nurses). Internal consistencies were satisfying. The means of the SVF120 scales and the JSS Frequency subscale ranged around the scale midpoints (i.e., 12 for the SVF120; 4.5 for the JSS). Mean of the GJS was considerable above the scale midpoint of 2.5 in both samples (i.e., minus one standard deviation was still above 2.5).

Several analyses were conducted to examine the differences between the two samples. A MANCOVA was computed with sample (sample 1 vs. sample 2) as between-subject factor, demographics (i.e., gender, education, and percentage of employment) as covariates, and character strengths factors, coping strategies, job satisfaction, and frequency of stress as dependent variables. Results indicated significant differences between the two samples in the dependent variables, $F(11, 374) = 2.72$, $p = 0.002$, partial $\eta^2 = 0.074$. Subsequently conducted ANCOVAs showed that nurses (sample 2) were more satisfied with their jobs than the participants in the mixed sample (sample 1; $F[1, 384] = 7.15$, $p = 0.008$, partial $\eta^2 = 0.018$; $M_{Sample\,1} = 3.75$ vs. $M_{Sample\,2} = 4.04$ corrected for covariates). Furthermore, nurses (sample 2) reported higher frequency of stress than the mixed sample of employees

Table 2 | Descriptive statistics, and reliability of the VIA-IS factors, SVF120 strategies, JSS, and GJS in sample 1 (mixed sample) and sample 2 (nurses sample).

	Sample 1 (mixed sample)					Sample 2 (nurses sample)				
	M	*SD*	*Sk*	*K*	*α*	*M*	*SD*	*Sk*	*K*	*α*
VIA-IS strengths factors										
Emotional	−0.07	1.04	−0.30	−0.08	—	0.08	0.95	−0.14	0.04	—
Interpersonal	0.04	1.07	−0.33	0.35	—	−0.05	0.91	−0.34	0.55	—
Restraint	−0.03	1.05	−0.21	−0.11	—	0.04	0.94	−0.26	1.17	—
Intellectual	0.03	1.03	−0.08	−0.33	—	−0.04	0.96	0.10	−0.33	—
Theological	−0.07	1.04	0.05	0.04	—	0.08	0.95	0.16	1.15	—
SVF120 strategies										
POS	12.51	2.23	−0.44	0.08	0.92	12.40	2.11	0.53	0.97	0.91
POS1	10.60	2.91	−0.10	−0.08	0.87	10.00	2.61	0.52	0.85	0.84
POS2	11.41	2.96	−0.21	0.00	0.88	11.79	2.73	0.55	0.84	0.87
POS3	15.88	2.63	−0.38	0.20	0.84	15.60	2.67	0.09	−0.09	0.85
NEG	10.38	3.45	0.38	0.12	0.95	10.46	3.55	0.32	−0.06	0.96
Stress and job satisfaction										
JSS frequency	4.54	1.30	0.36	0.18	0.92	4.59	1.13	0.11	−0.26	0.90
GJS	3.79	0.95	−0.92	0.87	0.80	4.00	0.87	−0.96	0.77	0.82

$N_{Mixed\,sample} = 214$ (71 men, 143 women); $N_{Nurses} = 175$ (11 men, 164 women). VIA-IS, Values in Action Inventory of Strengths; SVF120, Stress Coping Inventory; POS, positive coping strategies; POS1, devaluation/defense; POS2, distraction; POS3, control; NEG, negative coping strategies; JSS frequency, frequency subscale of the Job Stress Survey; GJS, Index of General Job Satisfaction. An em dash (–) indicates that the scores were not computed (factor scores).

(sample 1; $F[1, 384] = 7.85$, $p = 0.005$, partial $\eta^2 = 0.020$; $M_{Sample\ 1} = 4.46$ vs. $M_{Sample\ 2} = 4.69$ corrected for covariates). Overall, there were a few, but meaningful differences with small effect sizes (cf. Cohen, 1988) between the two samples.

RELATIONSHIPS BETWEEN CHARACTER STRENGTHS FACTORS AND COPING STRATEGIES

For an examination of the relationships between character strengths and coping, partial correlations (controlled for gender, education, and percentage of employment) between the SVF120 (coping strategies) and the VIA-IS (character strengths factor scores) were computed. **Table 3** shows the correlation coefficients for each of the two samples.

Table 3 shows that the relationships between coping and character strengths factors were similar across the two samples. As expected intellectual, emotional, and interpersonal strengths were positively related with positive coping strategies (POS); however, in sample 1 the correlation between interpersonal strengths and positive coping was not statistically significant although being in the right direction. Intellectual and interpersonal strengths were negatively related to negative coping strategies (NEG) as expected, but emotional strengths did not.

As stated in Hypothesis 1, intellectual strengths were positively correlated to the three different subcategories of positive coping. Emotional strengths were statistically more strongly related to control (POS3) than to devaluation/defense (POS1) and distraction (POS2) in both samples as expected in Hypothesis 2 (all $p < 0.001$ one-tailed; except difference between the correlation coefficients of POS3 and POS1 where $p < 0.05$ one-tailed, cf. Steiger, 1980). Interpersonal strengths were related to all coping strategies (i.e., POS, POS1, POS2, POS3, NEG) in sample 2 (nurses), but this was not the case in sample 1 (mixed sample). In sample 1 POS3 and NEG were significantly associated with interpersonal strengths. In line with Hypothesis 3, interpersonal strengths were more strongly related to the positive coping

strategies (POS) in sample 2 (nurses sample) than in sample 1 (mixed sample); the difference between the two correlation coefficients was significant ($p < 0.01$, one-tailed). This could be traced back to the numerically (but not statistically significantly) higher correlation coefficients for devaluation/defense (POS1; difference of coefficients: $p = 0.14$, one-tailed) and control (POS3; difference of coefficients: $p = 0.11$, one-tailed) as well as the statistically significantly higher correlation coefficient for distraction (POS2; $p < 0.01$, one-tailed) in sample 2 (nurses sample) compared to sample 1 (mixed sample). Strengths of restraint seemed to be of low relevance for the coping strategies. Theological strengths tended to be related to the positive coping strategy of distraction (POS2) in both samples, which also might have led to the positive correlation with positive coping strategies (POS).

WORK-RELATED STRESS, CHARACTER STRENGTHS, AND JOB SATISFACTION

For an examination of the relationships among frequency of work-related stress, character strengths, and job satisfaction, several steps of analyses were undertaken. Firstly, participants of the total sample were grouped into three stress-level groups (1 = low level, 2 = medium level, 3 = high level) using the anchors of the rating scale as cut-offs (i.e., low = scores lower than 4; medium = scores between 4 and 6; high = scores higher than 6). Secondly, six univariate ANCOVAs for the total sample were computed with stress-level groups as grouping variable, demographics as covariates (i.e., gender, education, percentage of employment), and with job satisfaction and the character strengths factors as dependent variables. Although nurses reported higher frequencies of work-related stress than the mixed sample, analyses yielded no statistically significant interaction effects between stress-group and sample on job satisfaction and the strengths factors. Hence, analyses were computed utilizing the whole sample with a higher statistical power (sample sizes of three stress-level

Table 3 | Partial correlations (controlled for gender, education, and percentage of employment) between character strengths (VIA-IS factors) and coping (SVF120 strategies).

SVF120	Emotional	Interpersonal	Restraint	Intellectual	Theological
Sample 1 (mixed sample)					
Positive coping strategies (POS)	0.14*	0.11	−0.02	0.38***	0.16*
Devaluation/defense (POS1)	0.14*	0.08	−0.07	0.28***	0.00
Distraction (POS2)	0.00	0.02	−0.01	0.28***	0.22**
Control (POS3)	0.26***	0.20**	0.03	0.36***	0.12
Negative coping strategies (NEG)	−0.03	−0.25***	0.03	−0.19**	−0.01
Sample 2 (nurses sample)					
Positive coping strategies (POS)	0.22**	0.36***	0.09	0.40***	0.16*
Devaluation/defense (POS1)	0.12	0.19*	0.09	0.39***	−0.01
Distraction (POS2)	0.07	0.32***	0.06	0.29***	0.23**
Control (POS3)	0.36***	0.32***	0.08	0.30***	0.11
Negative coping strategies (NEG)	−0.13	−0.26***	0.16*	−0.16*	−0.09

$N_{Mixed\ sample} = 214$ (71 men, 143 women); $N_{Nurses} = 175$ (11 men, 164 women). VIA-IS, Values in Action Inventory of Strengths; SVF120, Stress Coping Inventory.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

groups were $n_{\text{low stress}} = 126$, $n_{\text{medium stress}} = 214$, and $n_{\text{high stress}} = 49$), but also for each sample separately in order to provide a more comprehensive presentation of the results. Furthermore, results of ANCOVAs did not change, when covariates were not considered.

The stress level-groups showed significant differences in the intellectual strengths ($F[2, 383] = 6.08$, $p < 0.01$, partial $\eta^2 = 0.03$) and in job satisfaction ($F[2, 383] = 9.00$, $p < 0.001$, partial $\eta^2 = 0.05$). Intellectual strengths increased with the frequency of work-related stress ($M_{\text{low stress group}} = -0.17$ vs. $M_{\text{medium stress group}} = 0.01$ vs. $M_{\text{high stress group}} = 0.39$; low stress group and high stress group differed significantly from each other). Job satisfaction decreased with the frequency of work-related stress ($M_{\text{low stress group}} = 4.12$ vs. $M_{\text{medium stress group}} = 3.82$ vs. $M_{\text{high stress group}} = 3.51$; all groups differed significantly from each other). Results did not differ when splitting the total sample into three groups with equal sizes using the scores on the percentiles 33 and 66% what might be interpreted as a sign of the robustness of the results. Furthermore, results were highly similar when analyzing each of samples separately. Nevertheless, due to smaller sample sizes and consequently lower statistical power, some of the main effects were only marginally significant when analyzing each of samples separately (i.e., p-values for differences in the intellectual strengths were $p = 0.052$ and 0.086 in the mixed sample and in the nurses sample, respectively).

Character strengths as mediators in the relationship between stress and job satisfaction

As only the intellectual strengths were related to the frequency of work-related stress, only this character strengths factor met the requirement for a mediation analysis defined by Baron and Kenny (1986). Therefore, the examination of the mediation effect was conducted for the intellectual strengths, but not for the remaining character strengths factors. To examine whether intellectual strengths mediated the link between frequency of work-related stress and job satisfaction a path analysis was computed (utilizing Preacher and Hayes', 2008, indirect procedure) utilizing the total sample. The independent variable was frequency of work-related stress, mediator was the factor intellectual strengths, and the dependent variable was job satisfaction. Again, gender, education, and percentage of employment were the covariates. The results for the interplay between frequency of work-related stress, intellectual strengths, and job satisfaction are shown in **Figure 1**.

Figure 1 shows that high frequency of work-related stress was related to low scores in job satisfaction. Furthermore, this

FIGURE 1 | Regression model of the effect of frequency of stress on job satisfaction, which is partially mediated by intellectual strengths; $F(5, 383) = 6.64$, $p < 0.001$. *$p < 0.05$; ***$p < 0.001$.

association was mediated by intellectual strengths as expected in Hypothesis 4. Intellectual strengths increased with the frequency of stress. Furthermore, job satisfaction was higher with enhanced intellectual strengths. The mediation was a partial (and not a full) one, because there was still a significant association between frequency of stress and job satisfaction. Results were highly similar when analyzing each of samples separately. Nevertheless, due to smaller sample sizes and consequently lower statistical power, the path from intellectual strengths to job satisfaction did not reach statistical significance when analyzing each of the samples separately.

Character strengths as moderators in the relationship between stress and job satisfaction

Five hierarchical multiple regressions were computed to test the moderating effect of character strengths factors (i.e., one regression analysis for each of the factors). The control variables (i.e., gender, education, percentage of employment) were entered first, the main effect variables (i.e., z-scores of frequency of work-related stress and the character strengths factor of interest) entered in a second step, and the interaction term between z-scores of frequency of work-related stress and the character strengths factor in a third step. The interaction term must be significant in order to support the moderator hypothesis (Baron and Kenny, 1986). Hierarchical multiple regressions did not yield any significant interaction term (neither in the two samples individually nor in the whole sample). Therefore, character strengths were not moderators here and Hypothesis 5 could not be confirmed.

DISCUSSION

The present study was aimed at examining the role of character strengths as positive personality traits in dealing with stress. One of the core characteristics of character strengths is, that they determine "how an individual copes with adversity" (Peterson and Seligman, 2004, p. 17). Therefore, systematic relationships between character strengths and coping behavior were expected. Data presented from two samples (i.e., a sample of employees from various occupations and a sample of nurses) showed that character strengths (1) were systematically related to coping, and (2) mediated the effects of work-related stress on job satisfaction. Intellectual strengths were especially related to coping followed by emotional, and interpersonal strengths. Strengths of restraint and theological strengths were of little relevance for dispositional coping behavior. This is in line with the expectations derived from previous publications on coping with adversity (i.e., Peterson and Seligman, 2003; Peterson et al., 2006, 2008) and from content-driven assumptions.

Intellectual strengths were the ones most strongly associated with coping with work-related stress. They correlated with positive coping and every subcategory of it (i.e., devaluation/defense, distraction, control) as well as with negative coping in the intended direction. These results highlighted the importance of intellectual strengths for dispositional coping behaviors. Love of learning, judgment, curiosity, and creativity are components of the intellectual strengths factor (cf. Ruch et al., 2010). All those character strengths foster the production of new and reasonable
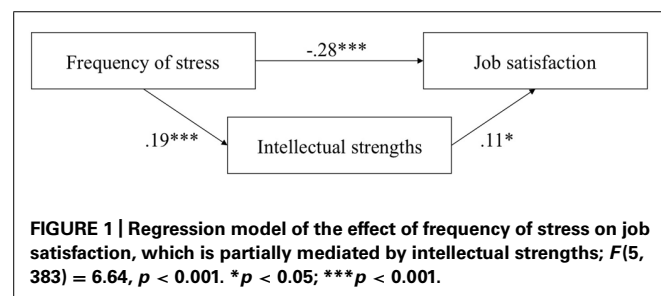
strategies for problem solving and the exploration of situational circumstances (cf. Peterson and Seligman, 2004), what in turn assists in the selection of the most successful coping strategies (i.e., positive coping) and the avoidance of unsuccessful coping strategies (negative coping). That might also explain, why intellectual strengths mediated the negative effect of work-related stress on job satisfaction. Additionally, challenges experienced during stress might foster intellectual strengths, which in turn are positively associated with job satisfaction. However, due to the cross-sectional design of the present study, conclusions regarding causality could not be drawn, and another causal direction could be assumed as well. For example, people with higher intellectual strengths might have a better education (cf. Ruch et al., 2010) and therefore work in jobs with more responsibility, which is associated with more stress. However, education served as a control variable in all analyses and results still emerged. Nevertheless, studies utilizing longitudinal and intervention designs are needed to address research questions regarding causality.

Interpersonal strengths were negatively related to negative coping (NEG) on both samples. People who see the bright side of life (humor) and have good relationships (because of their kindness) might show a lesser tendency to escape, withdraw from social contacts, ruminate, and give up. Furthermore, interpersonal strengths showed different correlation pattern with respect to positive coping strategies in a sample of nurses and a mixed sample (participants with different occupations). Especially the positive coping strategy distraction (POS3) was stronger related to interpersonal strengths in nurses than in the mixed sample. It has been highlighted that the (sometimes) problematic contact with doctors as well as patients and their relatives is an often-observed, characteristic stressor for nurses (e.g., Harris, 1989; Burgess et al., 2010). Hence, seeking distraction from this kind of strains might be very likely among nurses. Distraction can be achieved, for example, by focusing on someone that who is creating a situation incompatible with stress (Janke et al., 1985; Janke and Erdmann, 2008). This behavior might profit from interpersonal strengths that might help to create a kind and humorous atmosphere in situations with colleagues and friends what in turn helps to relax and distance from situations characterized by problematic conflict with others like the patients and their relatives.

Emotional strengths were found to be related to positive coping but less so to negative coping. Emotional strengths include active behaviors (e.g., being brave, persistent, and hopeful, having perspective), which foster an effective analysis of the situation and problem solving (i.e., positive coping strategies). This is in line with results reported by Gander et al. (2012), who found that an active, offensively minded work-related attitude toward obstacles and challenges was strongly associated with emotional strengths. Emotional strengths seem to assist controlling one's own reactions, and facing a stressful event directly rather than engaging in a more passive distraction or withdrawal, escape, rumination, and self-blame.

Theological strengths were related to distraction coping (POS2) in both samples. These character strengths include behaviors like being grateful, seeing the beauty, and meditation (Peterson and Seligman, 2004). Focusing on what one is thankful for and

meditation should foster relaxation and distraction. Furthermore, appreciation of beauty and excellence is related to the disposition to experience positive emotions like joy and awe (cf. Güsewell and Ruch, 2012), what might also foster distraction coping (POS2).

LIMITATIONS AND FUTURE RESEARCH

This study has several limitations that should be mentioned. First, because the data are self-reported, common method variance may have inflated correlations (cf. Doty and Glick, 1998). However, correlation pattern between coping and character strengths varied across the coping scales and the character strengths factors. Therefore, it was concluded that the results were not overly affected by this bias. Furthermore, self-ratings were the chosen source of data in the present study, because co-workers might not be able to provide a full reflection of the self-raters' possession of the character strengths. As people might just show certain strengths at work due to the formal requirements and restrictions (cf. Ten Berge and De Raad, 1999; Harzer and Ruch, 2013), it would be difficult to ascertain that everyone has a coworker that knows him or her well enough. Therefore, the validity of a peer-rating might be challenged. Furthermore, as the experience of stress frequency and the use of coping strategies were considered to be in large parts intra-individual experiences, the self-ratings were considered the most valid judgments. Nevertheless, future studies could utilize multiple data sources to eliminate the effects associated with common method variance.

Second, aiming at investigating the relationships between character strengths and coping in general, a cross-sectional design was chosen. However, the cross-sectional design did not allow any conclusions about causal relationships between the variables. Although causal directions and mechanisms were formulated in the paper occasionally in order to describe the assumed role of character strengths for coping with stress, studies utilizing longitudinal and intervention designs are needed to address research questions regarding causality. The cross-sectional design in combination with the low rate of unsatisfied participants in the presented data might have caused that there was no moderation effect for character strengths on the relationship between work-related stress and job satisfaction. Additionally, utilizing the two-item job satisfaction scale instead of a more extensive one used in the present study might have prevented the detection of interaction effects. Frameworks for studying personality in the stress process assume a moderating role of personality traits on the relations between stressor and outcomes like job satisfaction (cf. Bolger and Zuckerman, 1995). Personality influences the reactivity (i.e., emotional and physical reactions) within a stressful event. However, most studies examining the role of certain personality traits are diary studies (e.g., Bolger and Zuckerman, 1995; Hahn, 2000). The present study presented cross-sectional, self-rating data from samples moderate in size; the data therefore did not seem to be able to illustrate this process. Further research might study the process of coping with a stressful event and the role of character strengths within this process. For a further examination of the role of character strengths within the stress (and coping) process, the framework by Bolger and Zuckerman (1995) provides promising ideas. For example, it can be expected that character strengths influence the exposure to certain stressors, and that interpersonal strengths may

lead to more social contacts. Moreover, intellectual strengths may help to judge a stressful event more rationally and hence, lower the negative effect of stress on outcomes like job satisfaction. Additionally, character strengths may influence the decision of whether or not to use a specific coping strategy, and therefore the effectiveness of coping in a specific situation.

Third, the aim of the present study was to get a general overview on the relationships between character strengths and coping. Therefore, analyses were conducted on a very broad level of five character strengths factors and four coping scales. Given the fact, that on the most narrow level 24 character strengths and 20 coping modes are assessed in the measures utilized here, much more fine-grained investigations could be conducted in the future with multiple-source data from larger samples.

CONCLUSION

One approach to reduce the impact of work-related stress is to decrease the frequency of stressors. However, this might not be always possible. In the light of the present study, character strengths as trainable personal characteristics (Peterson and Seligman, 2004) seem to be important resources for the training on and/or off the job to improve coping with work-related stress. Studies have shown that character strengths can be fostered by systematic interventions (e.g., Gander et al., 2013; Proyer et al., 2013b). Fostering character strengths in employees might lead to a decrease in the negative consequences of work-related stress, because employees might be better able to cope with it. That might have a positive impact on the employees' job satisfaction, but also productivity, lowered absenteeism, and job performance (e.g., Landsbergis, 1988; Karasek and Theorell, 1990; Cooper and Cartwright, 1994; Harzer and Ruch, 2014). Furthermore, the results presented in the paper at hand might also be interpreted with respect to the implications for personnel selection. For example, when assigning (new) employees to positions with higher stress frequency, recruitment procedures might be designed to consider the level of character strengths especially relevant for coping with stress as well in order to lower the chance of negative consequences of work-related stress.

Overall, the present study underlined that character strengths relate to how individuals deal with adversities (in the workplace). They are associated with the strategies utilized by individuals to cope with stress, and buffer the negative effects of work-stress on job satisfaction. These findings open a new field for research on the role of personality (here: character strengths as positive traits) in coping with work-related stress. Further research is needed on the role of character strengths within the process of coping with a stressful event.

ACKNOWLEDGMENTS

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Exercise, character strengths, well-being, and learning climate in the prediction of performance over a 6-month period at a call center

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Background: Performance monitoring might have an adverse influence on call center agents' well-being. We investigate how performance, over a 6-month period, is related to agents' perceptions of their learning climate, character strengths, well-being (subjective and psychological), and physical activity.

Method: Agents ($N = 135$) self-reported perception of the learning climate (Learning Climate Questionnaire), character strengths (Values In Action Inventory Short Version), well-being (Positive Affect, Negative Affect Schedule, Satisfaction With Life Scale, Psychological Well-Being Scales Short Version), and how often/intensively they engaged in physical activity. Performance, "time on the phone," was monitored for 6 consecutive months by the same system handling the calls.

Results: Performance was positively related to having opportunities to develop, the character strengths clusters of Wisdom and Knowledge (e.g., curiosity for learning, perspective) and Temperance (e.g., having self-control, being prudent, humble, and modest), and exercise frequency. Performance was negatively related to the sense of autonomy and responsibility, contentedness, the character strengths clusters of Humanity and Love (e.g., helping others, cooperation) and Justice (e.g., affiliation, fairness, leadership), positive affect, life satisfaction and exercise Intensity.

Conclusion: Call centers may need to create opportunities to develop to increase agents' performance and focus on individual differences in the recruitment and selection of agents to prevent future shortcomings or worker dissatisfaction. Nevertheless, performance measurement in call centers may need to include other aspects that are more attuned with different character strengths. After all, allowing individuals to put their strengths at work should empower the individual and at the end the organization itself. Finally, physical activity enhancement programs might offer considerable positive work outcomes.

Keywords: call center, character strengths, learning climate, performance, psychological well-being, subjective well-being, virtues

INTRODUCTION

Amongst various organizational factors contributing to workers' well-being, performance monitoring has received less attention in prior studies (Holman et al., 2002). Stanton (2000) defines performance monitoring as those practices that involve "the observation, examination, and/or recording of employee work-related behaviors, with and without technological assistance" (p. 87). Utilizing performance monitoring, the first benefit that comes to mind is being able to monitor and improve employee performance, which ensure cost efficiency and customer satisfaction (Alder, 1998). Yet, employees are believed to profit from performance monitoring by means of the feedback they can obtain from their own performance; the feedback brings about an opportunity for employees to recognize their development potentials, improve their performance, and even feel more satisfied from the knowledge of their improved performance and abilities to cope better with work demands (Hackman and Oldham, 1976; Grant and Higgins, 1989; Aiello and Shao, 1993). Performance monitoring has been suggested even as a way to engender intrinsic motivation in employees and improve their well-being (Stanton, 2000). Nonetheless, performance monitoring has its own critics as it may adversely influence employees' remuneration and/or their relationship with coworkers (Alder, 1998). It has been known for a long time that performance monitoring can be used as an intermediary to intensify employees' workload and increase the level of work demand (Smith et al., 1992). Critics likewise distinguish performance monitoring as an influential factor on well-being, but mostly as a detrimental factor which impacts employees' well-being negatively (Stanton, 2000).

Call centers make perfect workplaces to study performance monitoring as most of them have electronic performance monitoring systems implemented to supervise their agents by means of several quantitative indicators such as length of call, number of calls, and amount of time on the phone. The quality of calls is, sometimes, assessed by listening or recording overtly or without the agent's knowledge (Taylor and Bain, 1999)—although the agents always know of the possibility of being recorded. Most often, the quantitative data generated from measuring seconds of employees' work/rest moments is the only way used to assess their performance, and even to determine their incentives and remuneration (Taylor and Bain, 1999; Holman et al., 2002; Garcia and Archer, 2012). This may explain why call centers are sometimes called "electronic panopticons" (Fernie and Metcalf, 1998, p. 9), "electronic sweatshops" or "the dark satanic mills of the twenty-first century" (Holman, 2003a, p. 123).

From an organizational point of view call centers are the frontline actors of the organization to deal with customer inquiries, hear their voices, and are representing the way an organization values its customers. Every second that an agent is not on the phone amounts to the precious queue time for customers (Garcia et al., 2012b). An appropriate workplace should be able to promote employees' satisfaction and well-being, and call centers are not an exception of this axiom, (Wegge et al., 2006). Prior studies, however, show that work is a demanding and stressful experience for many call center agents (Holman, 2005). Call centers' monitoring systems have shown to consign work-related stress, which in turn can possibly decreases employees' well-being and lessen their job satisfaction and organizational commitment (Taylor and Bain, 1999; De Ruyter et al., 2001). The working conditions in call centers might also affect employees' opportunities to organize their own work, and diminish their sense of freedom for decision-making (Garcia and Archer, 2012). Finally, about 50% labor turnover in U.S. call centers in 2000 (Bordoloi, 2004), a 21% turnover rate in a study of 14 call centers in Switzerland (Baumgartner et al., 2002), and overall 30–50% estimated average turnover rate per year (IBISWorld, 2008) utter clearly about the situation this specific type of work design leads to.

Understandably, call center management methods is growing as the popular subject of many studies (Deery and Kinnie, 2004); and as Taylor and Bain (1999, p. 102) suggest: "call center managements face a plethora of problems concerning motivation and commitment, labor turnover, the effectiveness of supervision and the delivery of quality and quantity performance." This study, accordingly, is devoted to take a comprehensive look at call center agents' performance. We want to investigate how performance over a 6-month period, monitored as "time on the phone," is related to agents' perceptions of their learning climate, positive personal characteristics (i.e., character strengths), well-being (subjective and psychological well-being), and physical activity.

LEARNING CLIMATE

The work climate denotes employees' perception of how they are treated and managed in their organization. Organizational climate can be defined as a set of attributes perceivable about an organization, which "may be deduced from the way that the organization and/or subsystems deal with their members

and environment" (Hellriegel and Slocum, 1974, p. 256); or, as employees' shared perceptions of organization's policies, practices, and procedures and the behaviors supported, expected, and rewarded in the organization (Schneider et al., 2011). Moreover, organizational climate can be considered as the indicator of organizational culture as deeper and less consciously held perceptions and affections by members (Schein, 1985). Organizational climate comprises different aspects ranging from leadership style, work conditions, work force responsibilities and development opportunities, job requirements, and general satisfaction.

Moreover, individuals tend to cluster related facets of work settings and perceive it as a specific climate of their organization, or their organizations focused climate such as climate for safety or climate for service (Schneider and Reicher, 1983; Schneider et al., 2011). Similarly, organizations may develop a climate focused on learning. Learning climate has been described as a climate that actively encourages behaviors and practices pertained to continuous development (Honey and Mumford, 1996). Learning climate may include mission, vision, corporate goals and strategies, structures and practices supporting learning, shared vision and goals, cooperative learning, challenging attitudes, continuous improvement, management support, learning-to-learn skills and lifelong learning commitment (Malone, 2003). Bartram et al. (1993a,b) have developed a measurement instrument for learning climate, which denotes seven facets of climate as: (1) *Management Relations and Style*, reflecting leadership style; (2) *Time*, reflecting the amount of time available for members to perform their tasks and learn; (3) *Autonomy and Responsibility*, denoting the control level and possibilities for decision-making and initiating actions; (4) *Team Style*, which is reflecting the possibilities for learning from senior and proficient colleagues; (5) *Opportunity to Develop*, comprising opportunities to learn new skills within the same job and probable job rotation strategies; (6) *Guidelines on How to Do the Job*, reflecting availability of task instructions and guidelines; (7) *Contentedness*, reflecting general satisfaction with regard to the workplace (Bartram et al., 1993a,b, 1996).

Organizations quality of their learning climate is usually assumed to be influential in the rate of organizational learning and organizational performance (Moss-Kanter, 1983). Organizational learning is an outcome of employees' attempts to deal with issues and problems they are experiencing at the workplace (Argyns and Schon, 1996). Accordingly, learning climate is believed to be important in organizations endeavor to motivate employees in order to enhance their efforts into their work (Neal et al., 2005; Boudrias et al., 2010). Creating a learning climate in which employees are able to learn from each other and new experiences is essential for the development of an organization and augmentation of well-being among its employees (Mikkelsen and Gronhaug, 1999; Sprigg and Jackson, 2006), that is, the empowerment of workers (Garcia and Archer, 2012).

Call-centers as specific workplaces where agents are spending most of their time on phone by themselves, responding to inquiries from customers may also hold a particular climate. Work at call center usually requires single and sometime monotonous work, thus, the influence of social aspects of the work climate (e.g., acting as a team member, helpful, and cooperative behavior) might not be applicable in such a context.

Nonetheless, other learning climate facets (i.e., Management Relations and Style, Time, Autonomy and Responsibility, Guidelines on How to Do the Job, and Contentedness) in call centers may be more relevant. Hence, this study tries to understand the learning climate facets contributing in enhancement of call center agents' performance. This leads to our first research question (RQ):

RQ1: Which learning climate facets significantly predict higher performance over a 6-month period?

CHARACTER STRENGTHS

Peterson and Seligman (2004) postulate that an important part of human functioning relates to strengths of character. Character components can be represented by values in action classification of strengths (Peterson and Seligman, 2004) as measurable continua of positive individual differences (McGrath et al., 2010). The values in action instrument classifies 24 character strengths into six main clusters called virtues: (1) *Wisdom and Knowledge*, cognitive strengths which require acquisition and use of knowledge such as creativity, curiosity, judgment, love of learning, and perspective; (2) *Courage*, strengths which involve willingness to achieve goals despite internal or external confrontation such as bravery, perseverance, honesty, and zest; (3) *Humanity and Love*, interpersonal strengths involving learning and supporting others such as capacity to love and be loved, kindness, and social intelligence; (4) *Justice*, strengths underling "healthy community life" such as teamwork, fairness, and leadership; (5) *Temperance*, as strengths which are preventing from actions beyond what is usual or proper such as forgiveness, modesty, prudence, and self-regulation; (6) *Transcendence*, strengths such as appreciation of beauty, gratitude, hope, humor, and religiousness (Seligman, 2002; Wright and Goodstein, 2007).

Peterson and Seligman (2004) consider an individual to possess, celebrate, and frequently exercise three to seven core strengths, so called "signature" strengths. The application of signature strengths in daily life has been suggested to contribute to an individual's life satisfaction, well-being, sense of flow, meaning in life, physical health and recovery from illness, and quality of life in general (Csikszentmihalyi, 1990; Seligman, 2002; Park et al., 2004; Seligman et al., 2005; Peterson, 2006; Littman-Ovadia and Steger, 2010; Proctor et al., 2011). In other words, frequently using one's signature strengths of character leads to the empowerment of the individual. Organizational studies, for instance, propose that endorsement and deployment of signature strengths in workplace enhances overall positive experiences about the working environment (Littman-Ovadia and Steger, 2010; Harzer and Ruch, 2012). Organizations can gain from the application of strengths under these two conditions; firstly, aptitude of employees to show behaviors related to a specific strength relies on a certain level that individuals need to possess that strength; secondly, organizational circumstances (e.g., work climate, work design) have to let or demand the expression of the strength (Harzer and Ruch, 2012). Moreover, different working positions tend to endorse some strengths more than others (e.g., managing positions endorse leadership and courage). Previous studies emphasize that benefits of applying character strengths can only

be flourished when being able to use one's signature strengths in significant life domains (Duckworth et al., 2005); accordingly, providing opportunities for employees to deploy their signature strengths in their work life is a key factor in workplace engagement, which in turn results in variety of work-related outcomes (e.g., enhanced performance; Harter et al., 2002).

Call-centers, due to their specific work design, may call for particular character strengths to boost their outcomes. Interpersonal strengths (i.e., love, kindness, and social intelligence) are probably not helpful when an agent is giving financial advice to a customer with other customers on hold to be answered in the shortest time, this might also attenuate teamwork as well. All said, what happens when an agent denote social intelligence, humor, and creativity as her core character strengths, considering that call centers work design more often demands fast, short, impersonal, and standardized, and even pre-determined in some cases, responses to customers? Which character strengths are more prone to foster enhanced performance for a call center agent? These are some of the uncertainties that lead to our second research question:

RQ2: Which main types of character strengths clusters (i.e., virtues) significantly predict performance over a 6-month period?

WELL-BEING AND EXERCISE

Well-being denotes "the state of being happy, healthy, or prosperous" (Cloninger, 2004; Well-being, 2013), hence comprising both physical and psychological state of individuals. According to Seaward (1994), well-being significantly relies on the balance between individual's physical, emotional, intellectual and spiritual aspects (see also Cloninger, 2004). Well-being has been studied from two distinctive viewpoints (Ryan and Deci, 2001; Kjell et al., 2013; Garcia et al., 2014a). First, studies of so called "subjective well-being" (Diener, 1984) focus on assessment of individual's judgments of life satisfaction, the frequency of positive affect, and the infrequency of negative affect (hedonic point of view); second, "psychological well-being" (Ryff, 1989) studies (eudemonic point of view) which focus on both theoretical and operational aspects of well-being by including six distinct constructs of well-being in their studies (i.e., autonomy, personal growth, self-acceptance, life purpose, environmental mastery, and positive relations with others). Psychological well-being constructs identify what promotes effective adoption to life events and emotional and physical health (Ryff, 1989; for a review see Garcia et al., 2012a).

Work environment has been clearly related to individuals' perception of both physical and psychological health (Sutherland and Cooper, 2000), and working in a comfortable and supportive environment enhances well-being among individuals (McGuire and McLaren, 2009). Previous studies have suggested that while physical enhancement of work environments will increase productivity of work forces (Brill, 1992), stressful work environments, in turn, result in physical and mental ill-health symptoms and low job satisfaction (Cunha and Cooper, 2002). Call-centers have been considered as one of the workplaces where agents experiencing both unpleasant physical and mental working conditions, considering the fact that a call center work tasks are often "sedentary and one-sided in front of the computer most

of the day" (Norman et al., 2004, p. 55). In many call centers the operators do not possess their own work unit, and unavailability of ergonomic and optimal workstations (e.g., adjustable chairs, tables, keyboard placements, input device placement, etc.) cause reports of pain from operators at the end of working days (Norman et al., 2004). Moreover, musculoskeletal disorders seem to be relatively common in call centers (Hales et al., 1994; Halford and Cohen, 2003; Norman et al., 2004). Halford and Cohen (2003) argued that performance-monitoring, workload, particular management-worker relations (e.g., lack of support), work-related stress, job characteristics (e.g., call-handling, repetition, monotony and noise-levels), lack of job control and frequency of computer usage are significantly associated with musculoskeletal disorder symptoms. Health issues have also been reported among call center agents due to time pressure, duration of the shifts (Ferreira et al., 1997), and work-related stress caused by shift work, lack of control and support at workplaces (Fenety et al., 1999). Furthermore, excessive use of scripts has been criticized because of reducing the skills of agents and their need to think (Wilson, 2006), and its positive relation to emotional exhaustion (Holman, 2003a,b). In a recent study, Krause et al. (2010) found a significant relation between effort-reward imbalance in call centers with musculoskeletal disorders among employees controlling for duration of computer use, ergonomic workstation design, physical activities during leisure time and other individual worker characteristics.

In recent years, however, studies have suggested physical activities (e.g., training programs) to be an efficient treatment for work-related health issues. Regular physical exercise involves planned, structured physical activity in order to improve aspects of physical fitness and functional capacity (Morris and Schoo, 2004). Regular physical activities have been positively associated with an individual's higher levels of subjective well-being and psychological well-being, improved coping, less depression, anger, and stress, better fitness, higher levels of sense of coherence, stronger feeling of social integration, improved physical self-concept, less psychosomatic complaints and musculoskeletal disorder discomfort, and reduced levels of mental fatigue (Norris et al., 1992; Alfermann and Stoll, 2000; Hassmén et al., 2000; Norlander et al., 2002; Lacaze et al., 2010; Garcia et al., 2012a).

Some detriments of working in call centers seem to ameliorate by employees regular exercising. Yet, Renton et al. (2011) noticed that call center employers, despite their motivation to promote physical activity among employees, have concerns regarding participation, fairness and cost and special limitations of workplaces. Interestingly, employers put forward the nature of call center work as one of the barrier for promoting physical activity among their employees (Renton et al., 2011). Considering the significance of well-being notions among call center agents and its above mentioned positive effects both on individual and organizational level, this study tries to investigate possible relations between well-being aspects and exercise with agents' performance. This leads to our final research questions:

> *RQ3:* Does well-being (i.e., positive affect, negative affect, life satisfaction, and psychological well-being) significantly predict higher performance level over a 6-month period?

> *RQ4:* Does exercise frequency and/or intensity significantly predict higher performance level over a 6-month period?

METHODS
PARTICIPANTS AND PROCEDURE
At Time 1 (T1) agents from a call center (135) in Sweden were invited to self-report their perception of the learning climate, virtues and character strengths, well-being, and how often and how intensively they engaged in physical activity. All agents were informed that their participation was voluntary and confidential and no supervisors were invited to participate. The job of the agents at this specific call center was to answer questions regarding financial advice. Agents were instructed to provide their "worker number" in order to trace responses from the T1 and T2. All agents participated in the first part of the Study and received cinema tickets for their collaboration. Participants' performance was then assessed for the next 6 consecutive months by the same system handling the calls. At the end of the 6 months, participants were asked to retrieve their performance and to report it directly to one of the researchers along their "worker number." Agents who provided their performance at the second part of the study received a cinema ticket for their collaboration. Although all agents participated in T1, a total of 110 agents (mean age = 42.77 SD = 13.35, 84 females and 26 males) chose to participate in T2.

MEASURES
Learning climate
The Learning Climate Questionnaire (Bartram et al., 1993a,b) comprises 70 items (1 = *extremely disagree*, 5 = *extremely agree*), organized in seven subscales that provide means for looking at the working climate in more detail: Management Relations and Style (e.g., "My immediate manager makes me feel like a valuable member of the team"), Time (e.g., "I have time to do my job properly"), Autonomy and Responsibility (e.g., "I feel free to organize my work the way I want to"), Team Style (e.g., "If we ask each other for help it is given"), Opportunities to Develop (e.g., "There are lots of different ways to learn new jobs here"), Guidelines on How to Do the Job (e.g., "Information relevant to my job is kept up-to-date"), and Contentedness (e.g., "People tend to put each other down," reversed item).

Character strengths
The short version of the Values In Action Inventory (Seligman, 2002) measures strengths of character that are organized in 6 character strengths clusters or virtues: Wisdom and Knowledge (e.g., "I am always curious about the world"), Courage (e.g., "I have taken frequent stands in the face of strong opposition"), Humanity and Love (e.g., "I have voluntary helped a neighbor/colleague in the last month"), Justice (e.g., "I work best when I am in a group"), Temperance ("I control my emotions"), Transcendence (e.g., "In the last month, I have been thrilled by excellence in music, art, drama, film, sport, science, or mathematics"). The participants are instructed to address grade of agreement in a 5-point Likert scale (1 = *very much unlike me*, 5 = *very much like me*).

different ways to learn new tasks and having opportunities to develop one's own strengths); two character strength clusters: Wisdom and Knowledge (e.g., being curious an thirsty for learning, open-minded, ingenious, social intelligent, and able to see things/problems from different angles) and Temperance (e.g., having self-control, being prudent, humble, and modest), and also by how frequently they exercised. Among the variables significantly influencing performance in a negative direction the analysis put forward contradictory results to those found in earlier research at other types of work places: autonomy and responsibility (e.g., the sense of feeling freedom to organize one's work, feeling encouraged to take responsibility and risk for one's own performance) and contentedness with the work place predicted low levels of performance over the 6-month time frame; strengths of character associated to helping others (i.e., Humanity and Love) and affiliation, fairness, and leadership (i.e., Justice) predicted low performance; the experience of positive emotions and satisfaction with life also predicted low levels of performance as well as level of exercise intensity.

The results with regard to learning climate postulate that agents' perception of the opportunities to learn new jobs and do different types of work makes them achieve more "time on the

Table 2 | Summary of the multiple regression analysis for learning climate variables, well-being and physical activity on the performance at work over the 6-month period.

	Predictor	Regression coefficients			
		B	**SE**	**β**	**t**
Learning climate	Management relations and style	1.65	2.68	0.06	0.61
	Time	0.40	2.37	0.02	0.17
	Autonomy and responsibility	**−11.49**	**3.13**	**−0.45*****	**−3.67**
	Team style	6.33	3.66	0.17	1.73
	Opportunities to develop	**13.23**	**3.33**	**0.50*****	**3.97**
	Guidelines on how to do the job	−4.00	4.47	−0.12	−0.89
	Contentedness	**−9.66**	**2.34**	**−0.38*****	**−4.12**
Character strenghts clusters	**Wisdom and knowledge**	**5.15**	**2.22**	**0.26***	**2.30**
	Courage	0.17	1.63	0.01	0.10
	Humanity and love	**−3.33**	**1.16**	**−0.28****	**−2.86**
	Justice	**−4.56**	**1.46**	**−0.32****	**−3.12**
	Temperance	**7.17**	**1.46**	**0.39*****	**4.91**
	Transcendence	3.46	2.18	0.20	1.59
Well-being	**Positive affect**	**−5.86**	**2.58**	**−0.23***	**−2.27**
	Negative affect	−4.94	2.82	−0.14	−1.75
	Life satisfaction	**−3.54**	**1.37**	**−0.24***	**−2.57**
	Psychological well-being	6.09	3.61	0.20	1.69
Exercise	**Exercise frequency**	**5.29**	**1.26**	**0.35*****	**4.21**
	Exercise intensity	**−1.88**	**0.79**	**−0.20***	**−2.38**

The model explained 55.4% of the variance in performance at work [$F_{(19, 109)} = 5.89$, $p < 0.001$].

Adj $R^2 = 0.46$, $F_{(19, 90)} = 5.89$; $p < 0.001$; $*p < 0.05$; $**p < 0.01$; $***p < 0.001$. Significant relationships highlighted in bold type.

phone," or simply spent more active time at work. Call center agents' specific job characteristics such as call-handling, repetition, monotony and noise-levels, and duration of the shifts might explain why agents strive for and embrace opportunities to learn alternative tasks or simply respond to different customer inquiries instead of repeating the same task all the time. Moreover, the hope for getting promoted or developing their skills and abilities might motivate agents to work harder, thus, being more productive and innovative (Sugrue, 2004). Moreover, the concept of Autonomy and Responsibility as part of the learning climate is quite in contrast with agents' job design of strict performance monitoring and lack of control over most aspects of their jobs. Perhaps explaining why agents' participation in decision-making and initiating actions only resulted in poor performance. Furthermore, "autocratic" decision-making processes have been supported for better productivity in more administrative tasks (Wood et al., 2013).

Oddly as it may seem, agents who were more contented about their workplace climate spend "less time on the phone." In other words, low levels of contentment were related to high levels of performance. Considering the call center work design, sometimes labeled "the dark satanic mills of the twenty-first century" (Holman, 2003a, p. 123), this might as well be an unsatisfied worker's response in order to "Libera Te Ex Inferis" or "Free Yourself From Hell" by trying harder to reach better opportunities; this in turn, goes hand-in-hand with our rationale with regard to the positive relationship between opportunities to develop and performance. The association between satisfaction with the workplace and work performance has been fueling an unsolved hot debate sometimes called the job satisfaction-performance controversy—doubting the existence, the directness, and the direction of causality in this relationship (Greene, 1972; Wood et al., 2013, p. 63, for a comprehensive discussion). For instance, in a recent study call center agents who first reported their performance over a 6-month period and then their emotions at work for the last weeks reported experiencing more positive emotions at work that those who reported their emotions first and their performance afterwards. Suggesting that thinking about their own performance had primed them to remember having experiencing more positive emotions at work (Garcia and Archer, Under evaluation).

In regard to character strengths clusters, Wisdom and Knowledge and Temperance are the only clusters that were positively related to agents' performance. Wisdom and Knowledge comprises strengths of character such as creativity, perspective, open-mindedness and love of learning; these strengths might help agents to handle each customer; after all the call center environment does not allow teamwork, or receiving/giving support from peers. Temperance is all about protecting oneself against excesses by exerting self-control and regulating feelings and actions, and also showing prudence, humility, and modesty. As described in the introduction call center agents are monitored for each minute of their time on the phone (e.g., Garcia and Archer, 2012) and need to manage their emotional expressions toward customers (Hochschild, 1983; Holman et al., 2002). For instance, the way agents display emotions and the effort involved in managing one's emotions in exchange for remuneration has been labeled "emotional labor" (Hochschild, 1983, p. 7). Hence, in order to be

Table 1 | Correlations among variables in the study ($N = 110$).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Performance (1)																				
Management relations and style (2)	0.00																			
Time (3)	−0.22*	0.24*																		
Autonomy and responsibility (4)	−0.29**	0.44**	0.65**																	
Team style (5)	−0.09	0.38**	0.43**	0.43**																
Opportunities to develop (6)	−0.07	0.55**	0.48**	0.68**	0.41**															
Guidelines on how to do the job (7)	−0.11	0.57**	0.61**	0.67**	0.63**	0.69**														
Contentedness (8)	−0.29**	0.22*	0.45**	0.41**	0.38**	0.45**	0.45**													
Wisdom and knowledge (9)	0.11	0.15	0.26**	0.30**	0.26**	0.30**	0.35**	0.11												
Courage (10)	0.17	0.33**	0.32**	0.23*	0.23*	0.19*	0.34**	−0.04	0.48**											
Humanity and love (11)	0.05	0.21*	−0.01	0.04	0.24*	0.24*	0.19	−0.01	0.38**	0.33**										
Justice (12)	−0.14	0.17	0.19*	0.24*	0.31**	0.33**	0.27**	0.14	0.57**	0.23*	0.52**									
Temperance (13)	0.34**	0.15	0.00	−0.08	0.12	0.01	0.04	0.05	0.10	0.23*	0.29**	0.13								
Transcendence (14)	0.02	0.41**	0.25**	0.39**	0.38**	0.49**	0.45**	0.15	0.55**	0.40**	0.57**	0.64**	0.15							
Positive affect (15)	−0.14	0.40**	0.42**	0.54**	0.44**	0.56**	0.58**	0.26**	0.48**	0.36**	0.28**	0.40**	0.09	0.54**						
Negative affect (16)	0.02	−0.30**	−0.22*	−0.30**	−0.23*	−0.25**	−0.31**	−0.30**	−0.07	−0.20*	−0.17	−0.12	−0.08	−0.18	−0.23*					
Life satisfaction (17)	−0.16	0.35**	0.25**	0.36**	0.37**	0.36**	0.32**	0.26**	0.27**	0.15	0.31**	0.38**	0.22*	0.55**	0.43**	−0.23*				
Psychological well-being (18)	0.08	0.31**	0.37**	0.34**	0.30**	0.32**	0.36**	0.19	0.61**	0.52**	0.42**	0.44**	0.15	0.63**	0.51**	−0.30**	0.49**			
Exercise frequency (19)	0.14	−0.15	0.01	0.04	−0.06	−0.07	0.00	0.09	0.29**	0.07	0.17	0.21*	−0.03	0.18	0.08	0.01	0.15	0.19*		
Exercise intensity (20)	−0.11	−0.05	0.17	0.01	−0.12	−0.09	−0.08	0.05	0.24*	0.10	−0.11	0.10	−0.09	0.05	−0.03	−0.01	0.06	0.18	0.29**	
Mean	83.31	4.12	3.22	3.27	4.18	3.12	3.78	2.87	7.21	7.34	7.49	6.68	6.70	6.91	3.66	1.53	4.99	4.59	4.48	6.17
Sd.	16.22	0.62	0.80	0.64	0.44	0.61	0.50	0.64	0.83	0.98	1.40	1.16	0.87	0.94	0.64	0.47	1.14	0.52	1.06	1.72
Cronbach' α	–	0.87	0.90	0.81	0.77	0.80	0.73	0.81	0.65	0.47	0.55	0.67	0.94	0.73	0.89	0.80	0.88	0.75	–	–

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

Subjective well-being

For the measuring affective component of subjective well-being we used the Positive Affect and Negative Affect Schedule (Watson et al., 1988), which requires participants to indicate on 5-point Likert scale to what extent (1 = *very slightly*, 5 = *extremely*) they generally experienced 20 different adjectives within the last few weeks. The positive affect scale includes 10 adjectives such as strong, proud, and interested; and the negative affect scale includes 10 adjectives such as afraid, ashamed, and nervous. The cognitive component of subjective well-being was measured using the Satisfaction With Life Scale (Diener et al., 1985), which consists of 5 items (e.g., "In most of my ways my life is close to my ideal") that require a response on a 7-point Likert scale (1 = *strongly disagree*, 7 = *strongly agree*). The Swedish versions of these instruments have been used in published studies (e.g., Garcia et al., 2012a).

Psychological well-being

We used the short version of the Scales of Psychological Well-Being (the short version; Clarke et al., 2001), which comprises 18 items; 3 items for each of the 6 psychological well-being dimensions. These dimensions are: (1) positive relations with others (e.g., "People would describe me as a giving person, willing to share my time with others"), (2) environmental mastery (e.g., " I am quite good at managing the responsibilities of my daily life"), (3) self-acceptance (e.g., "I like most aspects of my personality"), (4) autonomy (e.g., "I have confidence in my own opinions, even if they are contrary to the general consensus"), (5) personal growth (e.g., "For me, life has been a continuous process of learning, changing, and growth"), and (6) purpose in life (e.g., "Some people wander aimlessly through life, but I am not one of them"). The Swedish version has been used in previous studies (e.g., Nima et al., 2013) and in the current study the total psychological well-being score (i.e., the sum of the 18 items) was used.

Exercise frequency and intensity

Participants were asked to report how frequent (1 = *seldom or never*, 5 = *Very often*) and how intensive (1 = *low intensity*, 10 = *very intensive*) they engaged in physical activity. These two questions were imbedded among the age and gender questions. These questions have been validated to produce reliable answers regarding individuals' propensity to exercise (Karlsson and Archer, 2007).

Performance

Each worker's performance was assessed by the same system handling the calls each day over a 6-month period. Basically each worker has a minimum of 5 h schedule each day for being logged in the system waiting and handling inbound- and outbound phone calls (i.e., "time on the phone"). The system monitors these actions and divides the accumulated "time on the phone" by the time the agent was originally schedule to be on the phone. In other words, the performance measure is a percentage of the time the organization expects the agents to be working on calls or being ready to receive calls and the actual time agents deliver. The system handles absenteeism, caused by sickness or other type of absenteeism accepted by the organization, by simply not taking those days or hours into account when the performance measure is computed. This measure of performance is widely used in call centers (e.g., Garcia and Archer, 2012; Garcia et al., 2012b).

STATISTICAL TREATMENT

Expectation-Maximization Algorithm was used for handling and imputing missing data. *Little's Chi-Square* test for Missing Completely at Random was, $\chi 2_{(306, n = 110)} = 334.07$, $p = 0.13$. To reduce the impact of variables with outliers we first standardized the scores of each variable and tested if any cases had larger standardized scores than ±3.29, as recommended by Tabachnick and Fidell (2007). The analysis detected seven cases as outliers in the performance variable (i.e., standardized scores in excess of ±3.29). These scores were changed to the next highest/lowest (non-outlier) number +1/−1 (see Tabachnick and Fidell, 2007, p. 77). This reduced skewness for performance at work from −1.5 to −0.59 and kurtosis from 5.08 to.18.

RESULTS

The correlations, means, standard deviations, and reliability coefficients are reported in **Table 1**. Correlation analysis demonstrates that Time, Autonomy and Responsibility, and Contentedness together with the character strength cluster of Temperance are the only variables that correlate with Performance.

REGRESSION ANALYSIS

A Multiple Regression Analysis was conducted to assess whether learning climate, character strengths, subjective well-being, psychological well-being, Exercise Frequency and Exercise Intensity uniquely predicted performance at work among agents. The model explained 55.4% of the variance in performance at work [$F_{(19, 109)} = 5.89$, $p < 0.001$]. There were positive associations between performance at work and Opportunities to Develop ($B = 13.23$, $\beta = 0.50$, $t = 3.97$, $p < 0.001$), Wisdom and Knowledge ($B = 5.15$, $\beta = 0.26$, $t = 2.30$, $p = 02$), Temperance ($B = 7.17$, $\beta = 0.39$, $t = 4.91$, $p < 0.001$), and Exercise Frequency ($B = 5.29$, $\beta = 0.35$, $t = 4.21$, $p < 0.001$). There were negative associations between performance at work and Autonomy and Responsibility ($B = −11.49, \beta = −0.45, t = −3.67, p < 0.001$), Contentedness ($B = −9.66$, $\beta = −0.38$, $t = −4.12$, $p < 0.001$), Humanity and Love ($B = −3.33$, $\beta = −0.28$, $t = −2.86$, $p = 0.005$), Justice ($B = −4.56$, $\beta = −0.32$, $t = −3.12$, $p = 0.002$), Positive Affect ($B = −5.86$, $\beta = −0.23$, $t = −2.27$, $p = 0.03$), Life Satisfaction ($B = −3.54$, $\beta = −0.24$, $t = −2.57$, $p = 0.01$) and Exercise Intensity ($B = −1.88$, $\beta = −0.20$, $t = −2.38$, $p = 0.02$). See **Table 2** for the details.

DISCUSSION

The present study aimed to investigate if learning climate, character strengths clusters, well-being, and exercise habits predicted work performance over a 6 month period among call center agents. High performance was predicted by one learning climate dimension: agents' sense of having opportunities to develop at the work place (e.g., perceiving that there are

productive in such an "electronic sweatshop" (Holman, 2003a) the level of self-control seems to be important—possessing and exerting Temperance at a call center might help individuals to keep away from distractions and follow their schedule, to regulate their emotions and being humble when talking to angry customers. Moreover, although the time customers spend waiting in line is important for customer satisfaction (i.e., the more time in line the less customer satisfaction), there are indications showing that the information received and the way the customer has been treated is more important than time in line, especially for customers waiting great amounts of time (Garcia et al., 2012b). If so, besides a humble and self-controlling agent, customers might appreciate and receive more time from agents who exert the characters strengths included in the Wisdom and Knowledge cluster. Thus, perhaps explaining why this character strength cluster predicted high performance—agents high in these character strengths might expend more time explaining and/or searching for information while having the customer at the other end of the phone, which at the end means more "time on the phone" for the agent.

Also in this vein, character strengths clusters like Humanity and Love and Justice that are communal values, such as kindness and generosity, equity, and teamwork, are understandably related to low levels of performance. Celebrating, possessing and willing to exercise these virtues in a workplace that does not give opportunities for teamwork, organizing group activities and socializing with others may only add to thwarting the agents' feelings and consequently deteriorate their performance level. Also, spending time exerting communal values might lead to more time expending helping colleagues or trying to help customers beyond what is possible, thus, reducing the time agents spend on the phone.

The negative associations between performance and life satisfaction and positive affect simply suggest that agents reporting higher subjective well-being at the beginning of the study has resulted in lower performance during the 6-month period. This adverse influence of well-being on performance may be explained by the definition of subjective well-being, call centers' specific work-design, and expected performance criteria in a call center. Philosophy of hedonism considers pleasure as the only good thing for us (Forgeard et al., 2011) and suggests "the pleasant life" (pursuing pleasant emotions life) as the pathway toward happiness (Kristjánsson, 2010). Individuals experiencing higher levels of subjective well-being may find acting as a call center agent to be an unpleasant activity that leaves no chance to express, practice or experience pleasure at work. Hereafter it seems more understandable for them to put less effort into an unpleasant activity, thus, leading to lower work performance. Nevertheless, all positive measures of well-being (i.e., positive affect, life satisfaction, and psychological well-being) were related to the majority of the learning climate variables and character strengths clusters (see also Archer and Garcia, 2014; Archer and Garcia, who showed that subjective well-being is positively related to academic performance). In other words, well-being's relationship to performance might be a function of different learning climate and character strengths.

Finally, frequent physical activity predicted performance, while level of intensity of physical activity was negatively related

to it. Beneficial effects of frequent physical activities on different aspects of physical and mental health and well-being are well-understood (Fuchs, 2001; Schlicht, 2001; Teychenne et al., 2008; Garcia et al., 2012a). Regular exercising has been shown to have positive influence on several workplace outcomes such as performance, absenteeism and work productivity (Frigeri, 2010; Barr-Anderson et al., 2011; Arvidson et al., 2013), perhaps because frequent exercise reduces stress symptoms and improves mental states, and in the long term, enable arousal levels to be more appropriate adjusted for cognitive work and by increased stress resistance (Garcia et al., 2012b; Archer and Garcia, 2014). Frequent physical activity, for instance, was associated to the character strengths cluster of Wisdom and Knowledge; which comprises strengths of character needed in cognitive work and that were related to high performance in the present study. Conversely, high intensity of physical activity might give call center agents more strain than alleviation to their already strained working conditions. Indeed, previous studies show inconsistent results regarding the exercise intensity and its positive consequences (Salmon et al., 2003; Teychenne et al., 2008; Asztalos et al., 2010; Frigeri, 2010; Kirk and Rhodes, 2011)—academic performance, for instance, is related to intensity not frequency of physical activity (Archer and Garcia, 2014).

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The first limitation of this study may be related to the sample size that was relatively small. The performance measure used here, and in most call centers for that matter, accounts for agents' "time on phone," which is seen as the most important factor in determining customers' "queue time"; a factor that in turn is directly linked to customer's satisfaction level (Davis and Volmann, 1990; Durrande-Moreau, 1999). Indeed, some call center managers even define a "magic actual time" that when transgressed, leads to customer dissatisfaction (Garcia et al., 2012b). Yet, satisfaction with the information received and the way the customer has been treated by an agent has been shown to be among the most important factors for customer satisfaction (Garcia et al., 2012a,b). In their study including 5851 call center customers, Garcia et al. (2012a,b) concluded that, in fact, the information received and the way agents treated them are the dominant factors in determining customers' satisfaction level. Providing satisfactory information and behaving openly with customers as other performance indices need then to be addressed. Doing so might lead to different results that those found here with regard to learning climate, character strengths, and well-being.

In addition to the explanations given above with regard to well-being, it should not be overlooked that positivity (i.e., emphasizing the importance of positive notions such as life satisfaction, positive affect, flow, hope, optimism, virtues, and so on), as the heart of positive psychology movement (Seligman and Csikszentmihalyi, 2000) and other pertinent research themes such as positive organizational scholarship (Cameron et al., 2003) and positive organizational behavior (Luthans, 2002), has received criticism because of their "...implicit acceptance of fundamental flaws in how work and organizations are designed" (Hackman, 2009, p. 309). Hence, findings in this research vein may not be taken for granted without considering specific work settings

(see for example Garcia et al., 2014b, who tested the validity of a personality instrument designed for work force recruitment). Moreover, employees' perception of performance monitoring may have a moderation effect on the association between their well-being and their actual performance. Further investigations are definitely needed to disentangle the confusion raised from our findings.

PRACTICAL IMPLICATIONS

These findings denoted several practical opportunities for call center managers to enhance their agents' performance. First, improvement of work climate in call centers may need to include "opportunities to develop" as a decisive factor in keeping agents effortful to reach higher or more specialty-based positions in the organization. Second, human resources authorities in a call center should pay more attention to individual differences in the recruitment and selection procedures of call center agents to prevent future shortcomings or worker dissatisfaction. Nevertheless, the performance appraisal in call centers may need to go through a reconsideration process to include other aspects of successful performance that might be more attuned with different character strengths and individuals' happiness (i.e., life satisfaction and positive emotions). After all, allowing individuals to put their strengths at work should empower the individual and at the end the organization itself. Finally, physical activity enhancement programs, whether designed as a work routine activity of an agent or to be performed and rewarded in her/his leisure time, might offer considerable positive work outcomes.

> *"There is no greater sorrow*
> *than to recall happiness in*
> *times of misery"*
> *Dante Alighieri*

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Responsibility problems for criminal justice

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It has been argued that empirical science undermines the claim that people can deserve punishment, and that the criminal justice system therefore ought to be radically reformed. Such arguments lose their force if moral responsibility and desert do not depend on what caused the action, but on the agent's choice. We solve one problem for the justification of the criminal justice system, but create another one; if moral responsibility depends on the offender's choice, finding out to what extent she was responsible might be very difficult.

Our common practice of holding each other responsible for our actions contains elements of character evaluation and pragmatism, i.e., encouraging some behaviors and discouraging others. We also have the idea that people can be morally responsible for what they do in the sense of *deserving* to be praised for exemplary actions and blamed for bad ones—and even punished, if the action was bad enough. Many philosophers and legal theorists who believe that the primary goal of the criminal justice system ought to be crime prevention rather than the dealing out of just deserts, still argue that the offenders' desert ought to serve as a restriction on what we are allowed to do in the name of crime prevention; no one must be given more punishment than she deserves (e.g., von Hirsch, 1992; Lippke, 2014). Since no system is perfect, it is inevitable that this principle will *sometimes* be violated, but we ought to strive for a system that allows us to consistently approximate this ideal. However, if no one were morally responsible for anything, *all* punishments would be undeserved, and the criminal justice system difficult to ethically justify.

Some philosophers and scientists do argue for the non-existence of moral responsibility and desert, roughly along the following lines: Whether an offender was morally responsible for what she did depends on how her action was caused. If it was caused by events beyond her control, she lacks moral responsibility for it. Therefore, she does not deserve to be punished if her crime were caused by, e.g., psychosis, someone slipping a drug into her drink, or someone making an irresistible threat toward her. However, *all* crimes are ultimately caused by events beyond the offender's control (e.g., non-conscious events in her brain, genes and environment). Therefore, no one ever deserves to be punished (Pereboom, 2001; Strawson, 2002; Greene and Cohen, 2004; Harris, 2012). If these philosophers are right, any system for dealing with criminals resembling the current one might be ethically unjustifiable.

However, this whole argument fails if we deny the initial premise that moral responsibility for an action depends on how it was caused.

Some philosophers of law and legal theorists do deny that premise; Morse (2013) and Moore (1997) argue that the law as it stands permits punishing offenders when they are capable of making choices for reasons. Furthermore, there is nothing wrong with the law on this point; the thesis that offenders can deserve punishment for what they have chosen to do can be defended by philosophical argument. Many Kantian philosophers argue that actions can be viewed from two different perspectives; a theoretical one, where we explain why someone did what she did by pointing at causes, and a practical

one, where we focus on her choice and her reasons for taking one option rather than another. The claims we make from those different perspectives do not contradict each other. I might have chosen to become a philosopher for the reason that I found philosophy interesting. If a scientist were to discover the neurological causation of interest, it would still be true that I chose a philosophy career for the reason I did. Since morality is concerned with making the right choices for the right reasons, moral judgments ought to be made from a practical perspective. Whether someone was morally responsible for an action and deserves to be praised, blamed, or punished depends on the choice she made, not the underlying causes (Korsgaard, 1996; Bok, 1998; Dworkin, 2011, pp. 224 and 462; Jeppsson, 2012). I call this thesis "Practical Perspective Compatibilism," or PPC.

According to PPC, many offenders are morally responsible for what they did, and would thus deserve to be punished, since many offenders chose to commit a crime. PPC can also explain why some psychotic, drugged or seriously threatened offenders ought to be excused: in these states, they might very well be bereft of choice. Alternatively, in the case of a serious threat, the offender might have consciously chosen to do the least bad thing in a terrible situation; even if she were morally responsible for this choice we might judge that she did nothing *wrong* if she, e.g., stole an object because someone threatened to kill her children otherwise, and therefore she ought to go unpunished. It is evident that these excuses do not generalize to all offenders. It is still the case that many offenders choose to commit crimes, and

no advancements made in neurobiology or other empirical sciences will undermine this claim. Their choices may have had causes, but they were still choices. PPC thus solves one problem for the ethical justification of criminal justice, but it creates another one; if moral responsibility depends on the offender's choice, finding out to what *extent* she was responsible might be very difficult.

Drawing the line between agents who deserve some kind of punishment for committing a crime and those who ought to be completely excused might not be too difficult in most cases (Moore, 1997, p. 112; Kenny, 2010, pp. 392–401). But if moral responsibility and desert depend on the offender choosing actions, cases where the offender deserves less punishment due to having diminished responsibility for her crime will be difficult to judge[1]. If moral responsibility depends on the offender's choice, mitigating circumstances mitigate only insofar as they affect said choice. When the offender made less of a choice, she was less responsible (Jeppsson, 2012, pp. 58–67; Coates and Swenson, 2013). This claim is intuitively plausible. When choosing what to do, we try to find an option that we have most or at least sufficient reason to pursue, according to our own views about reasons (Jeppsson, 2012, pp. 59–60; see also Wolf, 1990, p. 31; implicit in Kapitan, 1986; Pereboom, 2008). (This assumption is not supposed to be controversial, since "our own views about reasons" may encompass a wide range of views.) We often consider only a few options, or immediately choose what to do without considering alternative actions at all, because it is immediately obvious to us that this option is at least good enough. But occasionally agents fail to consider options that were actually superior, according to the agents' own views about reasons, to the option they picked, merely because these other options somehow did not strike them as real alternatives. They fail to fully choose what to do. If moral responsibility depends on choice, someone who did not fully choose is plausibly less than fully responsible.

The PPC theory of diminished responsibility thus has the resources to explain,

not only why some psychotic, drugged or seriously threatened offenders ought to be completely excused, but also the fairly common judgment that a harsh environment can constitute mitigating circumstances (e.g., Hudson, 1995, 1999). We might think that a young criminal from a run-down, high-crime neighborhood is less responsible for her crimes, and therefore less deserving of punishment, than a young criminal who had everything going for her and yet chose to commit crimes. The criminal from the bad neighborhood might have been *expected* to turn to crime; she internalized these expectations, and failed to really see honesty as an alternative, even though an honest life might have seemed preferable to her had she really thought about it. She did not fully *choose* to become a criminal (whereas her more well-to-do counterpart made an active decision to engage in crime), and therefore her responsibility is diminished. These explanations of why a harsh environment is mitigating are intuitively more plausible than anything a causality-based theory of moral responsibility can provide, since it does not generally seem to be the case that causal influences behind one's choice renders one less responsible (I am presumably fully responsible for becoming a philosopher, despite the fact that this decision was undoubtedly influenced by a number of external factors).

However, we know that similar circumstances do not affect everyone equally. It is possible that a young criminal from a run-down and high-crime neighborhood did think things through and made an informed decision to become a criminal rather than engage in honest work. It is thus possible that out of two young criminals with a similar background, committing their crimes in similar circumstances, one is fully morally responsible for what she did and therefore deserves a harsh punishment, whereas the other one has diminished moral responsibility and deserves leniency. The same thing can be said about any circumstance that is normally considered mitigating; whether it diminishes the responsibility of this particular offender or not, depends on how it affected her choice. It seems difficult, to say the least, to ascertain how much punishment offenders deserve in particular cases,

if moral responsibility and desert depend on their choices.

We might try to ensure that we do not give some offenders more punishment than they deserve by adopting a generally lenient approach when sentencing (Duus-Otterström, 2013). Possibly, in order to be on the safe side, we would have to be very lenient, to an extent that seriously conflicts with the goal of crime prevention. However, there is some empirical support for the thesis that if people are led to believe that they were not really responsible for what they did, this belief makes them follow temptation rather than making active choices (Vohs and Schooler, 2008), i.e., people's belief that they lack moral responsibility might actually erode their moral responsibility. Even if we were willing to accept that there are offenders who are chronically bad at making choices and keep performing actions that they do not really believe that they have reason to do, and who therefore never come to deserve more than fairly mild punishment despite repeated crimes, a system that actually *pushed* people in that direction would certainly be a failed one.

Thus, PPC ensures that offenders can be morally responsible for their crimes and therefore deserve punishment, regardless of what neurobiology and other empirical sciences might find. But PPC also implies that finding out to what *extent* someone was responsible for what she did might be very difficult, perhaps even impossible.

CONCLUSION

If moral responsibility depends on the agent's choice rather than on her action being caused in the right way, we need not worry that findings in neurobiology or other empirical sciences will undermine the claim that people can be morally responsible for what they do. This might seem like good news for the criminal justice system, insofar as it depends on the assumption that offenders can deserve to be punished for its ethical justification. However, if an offender's level of moral responsibility ultimately depends on how she chose to do what she did, finding out to what *extent* she was morally responsible for her crime, and thus how much punishment she deserves, might be difficult. If we

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[1]Even if we set aside the acknowledged problem of matching up appropriate punishments with crimes (Duff, 1986, p. 280; von Hirsch, 1992).

ought not to punish anyone harder than she deserves, this is a problem that must be addressed.

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frontiers in PSYCHOLOGY

Responsibility and cooperativeness are constrained, not determined

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In the last decades, voices from the scientific community have advocated rejection of free will and personal responsibility (e.g., Cashmore, 2010). Interpretations of findings from neuroscience from the last decades have been used to support this deterministic assumption. Recent experiments, for example, have detected brain activity in the prefrontal and parietal cortex up to 10 s before the person is aware of any decision-making process (Soon et al., 2008; see also Libet et al., 1983). This has been interpreted as suggesting that consciousness is a *post-hoc* phenomenon, caused by unconscious neural activity in the brain. The view of the physical world as determined, and the human brain as the organ that enables the mind, leads to the conclusion that brains and minds are both determined. If free will is an illusion, the ramifications to penal law and personal responsibility need to be reconsidered (Cheema and Virk, 2012). Nevertheless, as humans we have an innate urge to experience a sense of agency or responsibility for our actions (Nichols, 2011). Even when confronted with setbacks, disappointments, and failures, humans maintain a sense of personal responsibility (see Gazzaniga, 2011). Failing to be aware of the self as the cause of one's own actions leads to aggressive and less helpful behavior (Baumeister et al., 2009). This article presents evidence that there is a possibility to develop an adequate sense of

responsibility and cooperation in the presence of genetic and environmental adversity.

We used data from a population-based cohort of 15-year old twin pairs, to assess genetic and environmental impact on self-reported Self-directedness and Cooperativeness by classic twin methodology (this data was published in Garcia et al., 2013). Here, however, we also describe the variation of these character traits in monozygotic vs. dizygotic co-twins of individuals with extremely low scores in Self-directedness and Cooperativeness. Self-directedness indicates how responsible, purposeful, reliable and resourceful an individual is in working to achieve her goals and values (i.e., agency), while Cooperativeness indicates how well adapted she is in getting along with others fairly, flexibly and with kindness (i.e., communion). Self-directedness and Cooperativeness are highly predictive of mental health problems across diagnostic categories (Cloninger et al., 1993).

The participants consist of same-sex twins included in the Child and Adolescent Twin Study in Sweden (CATSS), which is a nation-wide, population based, longitudinal twin study of mental health. Currently, the CATSS includes around 20,000 twins, born from 1992 to 2002, and has a response rate of about 80% (Anckarsäter et al., 2011), which makes it the world's

largest child- and adolescent psychiatric twin study. At the age of 15 the CATSS-twins of the 1994–1995 birth cohorts completed the short (125 items) or the longer version (238 items) of the Temperament and Character Inventory (TCI; Cloninger et al., 1993). The overall TCI response rate was about 55% and the total number of participants was 2714 (369 of whom completed the longer TCI as part of a clinical study). Zygosity is determined by a validated algorithm with a >95% predictive value compared to DNA-testing (Hannelius et al., 2007). In order to use all TCI responses, we extracted the items from the 238-version that correspond to the 125-version (see Garcia et al., 2013). Mx and SAS (version 9.3) softwares were used to disentangle the genetic and environmental contribution of Self-directedness and Cooperativeness. Intra-class correlations and univariate genetic analyses, by structural equation modeling, were calculated on the continuous scores of each dimension separately. A total of 831 adolescent same-sex twin pairs (423 monozygotic pairs and 408 dizygotic pairs) were used in this specific analysis.

We used the TCI mean and standard deviation scores of the 1994-CATSS cohort ($n = 1340$) in order to standardize the twins' Self-directedness and Cooperativeness scores to t-scores (IBM SPSS version 19) and identified the probands whose t-scores were ≤ 2

standard deviations below the general population's mean in each character dimension. If both twins in a pair met this criterion, one of them was randomly identified as proband and the other as co-twin. We found 28 monozygotic-twins and 32 dizygotic-twins who showed extremely low Self-directedness and 25 monozygotic-twins and 22 dizygotic-twins who showed extremely low Cooperativeness. In order to not depend on self-assessments alone, co-twins to probands who also had a parent rated DSM-IV disruptive behavior disorder (i.e., attention-deficit/hyperactivity disorder, oppositional defiant disorder or conduct disorder according to parent interviews by the Autism—Tics, AD/HD and other Comorbidities Inventory; Hansson et al., 2005) were specifically indicated in the plots. Twenty-nine percent of the variance in Self-directedness was attributable to genetic factors, 22% to environmental factors that make the twins reared together similar, and 49% to environmental factors that make the twins dissimilar. Thirty-eight percent of Cooperativeness was attributable to genetic factors, 21% to environmental factors that make twins similar, and 41% to environmental factors that make twins dissimilar (see Garcia et al., 2013).

Both monozygotic and dizygotic co-twins of probands with extremely low Self-directedness and Cooperativeness had an increased probability of reporting low (≤1 standard deviations) or extremely low Self-directedness and Cooperativeness (≤2 standard deviations) as compared to the general population (see **Figure 1**, population mean = 50, standard deviation = 10), but a considerable number of these individuals had developed character in the average or high range, in spite of having exactly the same, or half the genetic susceptibility of the problem-laden individuals. Co-twins to probands with both self-reported and objectively observed problems did not differ from the overall pattern.

Environmental and genetic adversities thus clearly give unequal opportunities to develop a sense of self-control, cooperation, and responsibility, but with a substantial plasticity. This study shows that it is possible to develop a mature character

FIGURE 1 | (A) Distribution of Self-directedness (t-scores) in monozygotic and dizygotic co-twins of adolescents with extremely low Self-directedness (<2 SD). **(B)** Distribution of Cooperativeness (t-scores) in MZ and DZ co-twins of adolescents with extremely low Cooperativeness (<2 SD). Each triangle denotes one individual. ▲ = Co-twin has a disruptive behavior disorder.
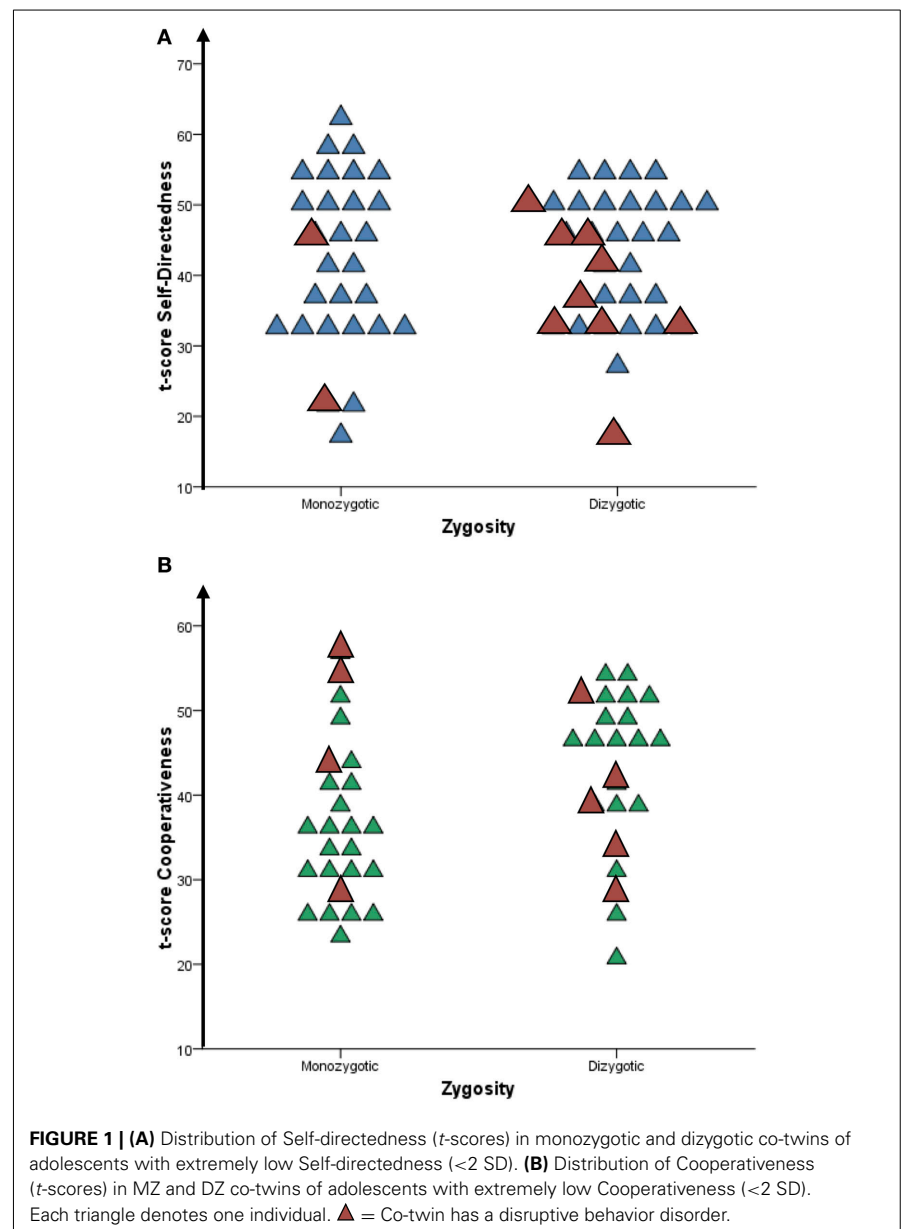
in spite of a genetic make-up and/or early environment associated with a deficient sense of responsibility and cooperation. A self-reported sense of responsibility and cooperation may not reflect actual freedom of action, but the scales used here were developed to assess the degree to which a person experiences that her behaviors over the life-span actually converge with her intentions, desires and conceptualized goals. The scales have also been shown to measure constructs that are highly relevant for mental health, including pro-social and constructive behavior patterns (Cloninger, 2004).

CONCLUSION AND FINAL REMARKS

The study does not support suggestions that society should change its stance/attitude on personal and penal responsibility in view of genetic or environmental determinism, or that interventions meant to promote responsibility and cooperation would be meaningless. Furthermore, philosophers have different ideas about what it takes to say that we humans have free will in a moral-responsibility-grounding sense (see Jeppsson, 2012). In contrast to the neuroscience-determinism outlined in the beginning of this article (i.e., that

unconscious neural activity in the brain enables the mind), philosophers also refer to determinism in terms of that, given the laws of nature and the past being precisely what they are, only one future is possible. In other words, if two persons had the exact same genetic structure and were exposed to exactly the same environmental influences, they would behave exactly the same. In this framework, some philosophers argue that humans cannot be free or morally responsible for anything if the world is deterministic or nearly deterministic. Others argue that, as long as we can choose what to do based on reasons and have enough self-control; humans can be considered free and morally responsible (e.g., Lenman, 2006). In this article we have showed that people do not lack moral responsibility only because they have "bad genes" or come from a "bad environment." Furthermore, the results shows that so far, we have no proof that determinism in the wider sense is true. However, neither does our study disprove that the world is deterministic in this sense. Twin studies cannot falsify this thesis, since not even twins growing up together are ever exposed to the same environmental influences down to the last detail.

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A non-reductive science of personality, character, and well-being must take the person's worldview into account

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In his foundational work for personality psychology, Allport (1927, 1937) distinguished personality from character. Personality was, on Allport's account, a descriptive concept referring to a psycho-physical structure, whereas character was *personality evaluated* in accordance with moral norms. When he introduced the paradigmatic "lexical" method of deriving personality trait terms from the dictionary, he therefore sought to exclude all trait terms with ostensive normative content. This approach had a profound effect upon the field, and researchers are still today working on how to optimally purge personality of normative content (e.g., Bäckström et al., 2009; Pettersson and Turkheimer, 2010). Its appropriateness as a paradigm for the entire field of personality psychology can, however, be questioned (Kristjánsson, 2012; Nilsson, 2014). It is plausible that some personality characteristics particularly relevant to psychic illness, human flourishing, and moral behavior are intrinsically value-laden (Cloninger et al., 1993; Cawley et al., 2000; Peterson and Seligman, 2004).

I will focus on Cloninger's approach here, because he has, in addition to introducing an influential model of character, discussed the philosophical foundations of the study of character and well-being. For Cloninger (2004), character is not only value-laden; it refers to uniquely human aspects of personality representing "what people make of themselves intentionally" (p. 44), as contrasted with their animalistic *temperament*. He wants the science of character and well-being to transcend the dichotomy between materialist reductionism and Cartesian dualism, by taking the person's consciousness, agency, and processes of self-growth seriously while integrating this with knowledge about the human physical and biological constitution. Although I agree with this idea of having a *non-reductive* psychological science, I disagree with Cloninger about what it entails. I will therefore review Cloninger's (2004) approach from a philosophical perspective, in a critical and, hopefully, constructive way. I will defend a notion of non-reductive psychology based upon contemporary academic philosophy and argue that Cloninger's approach is not genuinely non-reductive. I will suggest that a non-reductive psychological science must take the person's worldview into account and argue that Cloninger's approach limits our understanding of human psychology by not considering the role of worldviews in the development of character and well-being.

NON-REDUCTIVE MATERIALISM

Today, philosophers who seek to transcend the dichotomy between reductive materialism and Cartesian dualism generally adopt some version of *non-reductive materialism* (Davidson, 1963, 1970; Fodor, 1974; Searle, 1983, 1992; Chalmers, 1996), claiming that although all mental states and events are causally realized in the brain, there is not a particular *type* of brain state corresponding to each *type* of mental state. The reason for this is that we identify and individuate mental states in terms of a folk psychological language of "attitudes," "beliefs," "desires," "emotions," "goals," etc., which is *holistic*, insofar as it describes mental states as partly constituted by their relations to each other and their neurophysiological realization and behavioral manifestation as therefore dependent upon the entire network of mental states. In other words, on non-reductive materialism, no particular belief, goal, desire, or other intentional state, let alone a more complex folk psychological concept such as "personality," "character," or "well-being," can even in principle be isolated and *reduced* to neurophysiology or behavior, and these irreducible folk psychological concepts are crucial for understanding human psychology.

A key implication of non-reductive materialism is that human experiences and actions are imbued with meaning; to treat human beings as *persons*, rather than mere mechanical systems or animals, is to treat them as linguistic beings, who construct reasons and act upon them (Hacker, 2007), partly driven by needs to create and sustain meanings and to assuage fears and anxieties fueled by their uniquely human awareness of their existential condition (Nilsson, 2013). Although meaning-making is today studied in such different fields as the psychology of adaptation and well-being (Janoff-Bulman, 1992; Wong, 2012), social psychology (Greenberg et al., 1986; Heine et al., 2006), and neuropsychology (Gazzaniga, 2005), researchers rarely take into consideration the fact that meaning is constructed within a *worldview*—the person's most basic beliefs, values, constructs, and scripts for understanding, evaluating, and acting upon reality, which ground the network within which more specific beliefs, goals, intentions, etc., are embedded. A person necessarily lives *through*

a worldview—s/he can only, for example, act, morally or immorally, upon a worldview, and experience well-being, in its distinctly human form, through a worldview. A non-reductive psychological science must therefore treat the person's worldview as an aspect of personality *in its own right*, not reducible to behavioral or mental regularities (i.e., traits; Nilsson, 2014). Although personalists (Allport, 1937; Stern, 1938; Mounier, 1952; Lamiell, 1987), narrative psychologists (Tomkins, 1965, 1979; McAdams, 1992, 2008), and construct psychologists (Kelly, 1955; Little, 2005) have contributed to such an endeavor, worldviews do not receive the attention they deserve in contemporary psychology (Koltko-Rivera, 2004; Nilsson, 2013, 2014).

CLONINGER'S TRANSCENDENTALISM

Cloninger's (2004) approach instead merges elements of folk spirituality (cf. Forman, 2004), Eastern thought, Hegelian metaphysics, and quantum physics. He suggests that a person's consciousness can be developed, through a process catalyzed by meditation, reflection, and contemplation, toward increasing self-awareness, wisdom, goodness, and well-being. In the final, *self-transcendent* stage, the person is freed of all "dualistic" thought of body, mind, and spirit as separate and recognizes that "the individual mind is like a node in a universal Internet of consciousness" (p. 36), thereby attaining "coherence" of body, mind, and spirit, unconditional well-being, potential access to other minds, and "direct self-aware perception of what is real and true without misunderstanding as a result of preconceptions, prejudices, fears, desires, and conflicts" (p. 325). Cloninger (2004) also draws parallels between self-transcendent consciousness and quantum phenomena, including the impossibility of precisely determining the state and location of quantum particles ("*non-locality*") and the Higgs field within which particles acquire mass, and he claims, furthermore, that the unpredictability ("*non-causality*") of quantum physical events is "another way of talking about freedom" (p. 73) and that "the thought of gifted people involves intuitive leaps or quantum jumps, not deductive algorithms" (p. 65; cf. Capra, 1975).

Cloninger (2004, p. 317) makes clear that what he is proposing is not just a psychological theory, but also a philosophy of science:

> The science of well-being is founded on the understanding that there is an indissoluble unity to all that is or can be. The universal unity of being is recognized widely as an empirical fact, as well as an essential organizing principle for any adequate science [..] the universal unity of being is the only viewpoint consistent with any coherent and testable science.

This passage is puzzling insofar as it describes the postulated unity of being both as empirical fact, which implies that it is open to empirical refutation, and as *essential* organizing principle constitutive of research in this area, which implies that it is, in Quine's (1953) terminology, close to the center of the scientific field and therefore not easily changed. Given that Cloninger (2004) suggests that recognition of the unity of being-thesis is ultimately intuitive and not amenable to rational argumentation or objective test, and that its critics lack self-awareness, this thesis is more properly treated as a presupposition and interpretive framework than as an empirical fact (Popper, 1959).

But whether this is an appropriate, non-reductive foundation for the study of persons is questionable. On the non-reductive account I am proposing, what is *essential* is that we take the person's subjective experiences and their meanings seriously, *in psychological terms*, treating them as *real and irreducible*; not that we assume that special forms of experience convey true insight into the nature of reality. One problem with Cloninger's approach is precisely that it does not give meaning-making the role that it deserves in personality measurement and explanation of experience and action. Cloninger (2004) offers parallels to quantum physics rather than an account of reason-based explanation (Davidson, 1963; Searle, 1983) and Cloninger et al. (1993) measure character with traditional trait-type items which focus on typical behaviors and experiences, rather than worldview-type items which ask persons about their most basic beliefs, values, goals, and so on (Nilsson, 2014). Cloninger's use of quantum physics to describe the mind is,

furthermore, whether interpreted as an "analogy" (p. 65) or as an explanation of "actual" processes underlying self-aware consciousness (p. 328), difficult to reconcile with non-reductive materialism. Although it is conceivable that the hitherto unidentified mechanisms through which the brain causes consciousness, agency, and certain qualitative feels operate at the quantum level (Chalmers, 1996; Searle, 1997), the folk psychological concepts that render our experiences and actions meaningful and agentic are, because of their *logical* holism, as irreducible to quantum physics as to classical physics, and we have little reason to assume that the *causes* of conscious experiences are isomorphic with their qualitative feels (Stenger, 1993; cf. Brown et al., 2013). Similar to this, Cloninger's (p. 38) invocation of Allport's definition of personality as a "psychophysical system" is inconsistent with non-reductive materialism, insofar as it is understood as implying that personality can be reduced to a neuro-physiological causal system (Nilsson, 2013). Finally, the Hegelian monist metaphysics Cloninger (2004) draws upon is rejected today even by Hegelians. For example, Pippin (1989, p. 4)—one of several philosophers reinterpreting Hegel in non-metaphysical terms *in order to rehabilitate his philosophy*—thinks that the "metaphysical monist or speculative, contradiction-embracing logician [..] is not the historically influential Hegel."

IMPLICATIONS FOR RESEARCH

Cloninger et al. (1993) model divides character into: (1) *self-directedness*, or agency, which incorporates acting deliberately on personal goals and values, taking responsibility for actions, and developing resources for goal pursuit and self-acceptance, (2) *cooperativeness*, or communion, which incorporates compassion, empathy, helpfulness, acceptance of others, and acting on moral principles rather than self-interest, and (3) *self-transcendence*, which incorporates a sense of unity underlying the universe and connecting the self with the world around it, intuitive apprehension of relationships that cannot be explained rationally or observed objectively, and experiences of flow, absorption, and self-forgetfulness. These aspects of character

correspond, respectively, to the person's relation to the self, to others, and to the universe. As such, they undoubtedly refer to basic aspects of our intentional engagement with the world. But the model does not take different worldviews into account. Self-transcendence, in particular, appears conflated with *spiritual self-transcendence*—that is, self-transcendence *through* spirituality. Self-transcendence, in a more general sense, can be understood as the pursuit of meaning and identity through participation in, and selfless contribution to, something larger than the self, whether this is a divine or spiritual reality, a community of persons or sentient beings, or an ideological ideal (Schwartz, 1992; MacDonald et al., 1998; Koltko-Rivera, 2004). It requires only that the person is connected to the outside world through intentional directedness at, and engagement with, that world; it does not require an actual physical or spiritual connection between the person and that toward which s/he directs him-/herself.

More generally, I suggest that character can be understood in terms of the interaction between the three proposed dimensions and the person's worldview, and that researchers therefore need to investigate how different worldviews facilitate and inhibit the development of character. Because character is an intrinsically normative concept, what counts as character is partly an empirical question—character is what turns out to produce desirable psychological, moral, and social consequences. We might ask, for example, if, and if so *how*, different worldviews can be reconciled with *ethical* self-transcendence, selfless love, genuine happiness, tolerance, creativity, autonomy, and experiences of wonder, beauty, and awe. It is, I suggest, unlikely that there is one ultimate path of character development suitable for all persons. Cloninger's (2004, p. 29) own observation that "outstanding exponents of positive philosophy have often had limited success in helping their followers develop coherence" is true, I suggest, partly because neither worldview nor the development of character and well-being is a one-size-fits-all. By considering the full potential range of personalities emerging from the diversity of human worldviews, we can, I contend, better understand and encourage the development of character

and well-being, thus potentially harnessing the full positive potentials of humanity for cultural and social progress (cf. Cloninger, 2004, 2008, 2013).

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Pursuit of communal values in an agentic manner: a way to happiness?

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The present research studies the association between traits, values, and life satisfaction. While values should influence the direction of an individual's goals and behavior, his/her traits impact effort-expenditure, efficiency, and persistence in goal-pursuit. We apply the framework of the "Big Two" of agency and communion (Bakan, 1966) for distinguishing the content of values and traits. While agentic content refers to qualities relevant for goal-attainment, such as assertiveness, competence or persistence, communal content refers to qualities relevant for the establishment and maintenance of social relationships, such as being friendly, helpful, or fair. We predict that high scores on communal values and high scores on agentic traits are associated with life satisfaction. We test these predictions in two studies conducted in different countries (Germany and Russia) with different cultural background. The findings support our reasoning: across both countries we find positive associations of communal values and agentic traits with life satisfaction; and individuals high in communal values and high in agentic traits are most satisfied with their lives. In Russia, the association of communal values with life satisfaction is moderated by agentic traits; in Germany, however, there is a main effect of communal values.

Keywords: values, the big two, agency and communion, life satisfaction

INTRODUCTION

There is a long research tradition on how people may achieve well-being and happiness, which is considered a major goal in life (Fredrickson, 2001; Gable and Haidt, 2005; Diener and Biswas-Diener, 2008; Diener, 2012). Individual differences approaches, for instance, show that extraversion and emotional stability are strongly associated with life satisfaction (Diener and Lucas, 1999). Social psychological approaches suggest that supportive social networks, having friends, and living with a spouse enhance life satisfaction (Argyle, 1999). Moreover, interactionist approaches study if the impact of situational conditions on an individual's happiness varies with personality (for overviews see Diener and Biswas-Diener, 2008; Hefferon and Boniwell, 2011).

Life satisfaction is the cognitive component of an individual's well-being, while positive and negative affect are the affective components. The present research adds a novel framework to the analysis of global life satisfaction, a cognitive appraisal of one's life overall, which is distinct from domain-specific life satisfaction such as satisfaction with the self, with one's social relationships, or one's leisure time (Diener and Lucas, 1999; Diener, 2012).

The present approach introduces the agency/communion distinction into research on life satisfaction. The agency/communion distinction (a so called the "Fundamental Dimensions" or the "Big Two"; Paulhus and John, 1998; Abele and Wojciszke, 2014) has been influential in work on person perception, self-perception and personality, but not in research on life satisfaction. Additionally, we look at the joint impact of two variables that have so far seldom been studied in combination. These are an individual's self-concept regarding agentic and communal

traits and individuals' agentic and communal values. We will first outline the basic concepts and present the theoretical reasoning. We will then test our hypotheses using data collected in two culturally different countries (i.e., Germany and Russia).

The distinction between agency and communion (A and C) is among the most influential pairings of content in psychology. Coined by Bakan (1966), these two conceptual labels have provided an effective framework for the analysis of traits, behaviors, values, motives, and social cognition (for reviews see Paulhus and John, 1998; Judd et al., 2005; Trapnell and Paulhus, 2012; Abele and Wojciszke, 2014). While agentic content refers to qualities relevant for goal-attainment, such as assertiveness, competence, or persistence ("getting ahead," Hogan, 1982), communal content refers to qualities relevant for the establishment and maintenance of social relationships, such as being friendly, helpful, or fair ("getting along"; Hogan, 1982). Agency and communion constitute two separate clusters of meaning (Abele and Wojciszke, 2007). They capture the two recurring challenges of human life – pursuing individual goals and being a member of social groups and relationships (Ybarra et al., 2008). People may hold many different values and they may believe that they possess many different traits (i.e., concepts of the self). This variety is usefully categorized into a more limited number of classes of traits and values using as framework the A and C distinction.

Values are described as cognitive representations of basic motives or as rather stable broad life goals that are important to people in their lives and guide their perception, judgments, and behavior (Rokeach, 1973; Schwartz, 1992). They specify what is important in a culture and what is important for individuals

(Trapnell and Paulhus, 2012). Values are motivational forces that influence goals and the direction of behavior.

The self-concept refers to an individual's beliefs about himself or herself, including the person's traits and who and what the self is (Baumeister, 1999). Beliefs about own traits (i.e., one component of the self-concept) should influence effort-expenditure and efficiency in behavior and goal-pursuit. If, for instance, a person believes himself/herself to be competent and assertive, then he/she may try harder and be more confident to reach his/her goals than if he/she believes not to be competent and/or assertive enough to be successful in goal-pursuit. A recent meta-analysis regarding the nature of the relationship between values and traits (Parks-Leduc et al., 2014) revealed moderate associations demonstrating that traits and values are distinct constructs.

In this context, a rich set of data shows that both values (Trapnell and Paulhus, 2012) and people's spontaneous self-descriptions (Diehl et al., 2004; Uchronski, 2008) can be organized into the A and C framework; thus, giving a clearer picture of the link and differences between values and the self-concept. People, for example, differ in the importance they place on "getting ahead" (A values) versus "getting along" (C values). These basic values are, in turn, deeply connected to personality and an individual's self-concept, as they emerge in the socialization process. Indeed, self-ratings on various trait scales also result in these two content factors (A & C; Abele and Wojciszke, 2007, 2014). People describe themselves with different degrees of agentic and communal traits.

In regard to values, most cultures hold C values in higher regard than A values (Trapnell and Paulhus, 2012). Acting in accord to the values in one's culture fosters an individual's well-being (Myers and Diener, 1995). Furthermore, self-determination theory (Kasser and Ryan, 1996) distinguishes between "intrinsic" goals like affiliation and feelings of community and "extrinsic" goals like aspirations for financial success and social recognition. Albeit intrinsic and extrinsic goals are not the same as C and A values they nevertheless are related. Intrinsic goals are related to C values, and extrinsic goals are related to A values. Self-determination research shows that intrinsic goals are associated with well-being, whereas extrinsic goals are associated with lower vitality (e.g., Kasser and Ryan, 1996; Kasser et al., 2014). Hence, both the higher appreciation of C values in many cultures and research on the pursuit of intrinsic versus extrinsic goals suggests that C values are more strongly related to life satisfaction than A values. In support to this prediction Hofer et al. (2006) found that values in the domain of intimacy-affiliation (the C domain in the present terminology) were associated with life satisfaction. Values in the domain of power (the A domain in the present terminology), however, were independent of life satisfaction. An indirect evidence for a positive association between C values and life satisfaction comes from studies on spending or helping others. These behaviors – which are mainly based on C values – enhance an individual's well-being (Dunn et al., 2012). Research showing a positive association between social relationships and life satisfaction (Argyle, 1999; Diener and Biswas-Diener, 2008) does also indirectly suggest that C values may be more closely related to life satisfaction than A values.

On the other hand, research on A and C traits shows a different pattern. For example, research by Helgeson (1994) showed that A traits are associated with reduced depression, anxiety, and health complaints; whereas C traits show less clear associations with well-being parameters. Similarly, Saragovi et al. (2002) found that although A traits and C traits were both positively related to positive affect and social adjustment, only A traits were positively associated with life satisfaction. In addition, A traits are correlated with variables that are also correlated with life satisfaction (Çivitci and Çivitci, 2009; Kong et al., 2014), such as, self-esteem (Abele et al., 2008a; Wojciszke et al., 2011; Gebauer et al., 2013) and self-efficacy beliefs (Abele, 2003). In contrast to C traits, studies show that A traits predict longitudinal success in an individual's occupational career (Kirchmeyer, 1998; Abele, 2003; Abele and Spurk, 2011), that A traits are also malleable in response to success and failure experiences (Abele et al., 2008a; see also Uchronski et al., 2012), and that A traits predict an individual's feelings of competence (Locke and Nekich, 2000; see also Locke, 2003). In sum, A traits seem to enhance an individual's feelings of competence and of self-efficacy; A traits are positively associated with self-esteem; and A traits are related to reduced depression and health complaints. Moreover, A traits instigate behavior which is success-oriented and leads to actual to success. C traits do not show this pattern of associations. As feelings of competence, of self-efficacy, positive self-esteem, and success experiences are associated with life satisfaction, thus, also suggesting that A traits are associated with life satisfaction both directly but also indirectly.

THE PRESENT STUDY

An individual's values and his/her beliefs about own traits may be organized into the A and C framework. With this framework in mind, earlier research points to an asymmetry, suggesting that C values are more beneficial for an individual's life satisfaction than A values (Kasser and Ryan, 1996; Locke, 2003; Hofer et al., 2006; Dunn et al., 2012; Kasser et al., 2014) and that A traits are more beneficial for an individual's life satisfaction than C traits (Helgeson, 1994; Saragovi et al., 2002). We therefore predict that people with high C values and with high A traits are more satisfied with their lives than people with low C values and low A traits. Also in this line, if an individual feels that he/she does not have the competence and persistence (i.e., high in A traits) to follow her C values then the effect of values on life satisfaction may become smaller. In other words, we will also investigate if the association of C values with life satisfaction is moderated by A traits.

As there are cultural differences in the determinants of life satisfaction (Oishi et al., 1999; Diener and Lucas, 2000), our hypotheses will be studied in two different cultures, Germany and Russia. Germany and Russia differ in economic wealth and in several important culture dimensions (http://geert-hofstede.com/germany.html; Hofstede, 2001). Germany is, for example, a more individualistic and masculine culture than Russia (Hofstede, 2001). Nevertheless, data suggests that the stronger association of A traits, compared to that of C traits, with self-esteem does not only hold in individualistic cultures like Germany (Abele et al., 2008a; Gebauer et al., 2013), but also in

somewhat more collectivistic cultures like Poland (Wojciszke et al., 2011) and even in a clearly collectivistic culture like China (Bi et al., 2013). In specific samples of Southern China, however, researchers also found a positive association of C traits with self-esteem, but this was lower than the one between A traits and self-esteem (Bi et al., 2013). It seems that the stronger association of A traits with self-esteem than of C traits with self-esteem holds across cultures. In addition, Hofer et al. (2006) found that the positive association between C values and life satisfaction did not differ between cultures (Cameroon, Costa Rica, Germany); and the zero association between A values and life satisfaction also holds across these cultures. Even if this set of findings are still small, it suggests that the association between values, traits, and life satisfaction may be similar across cultures.

HYPOTHESES

To sum up, we state the following hypotheses: (1) C values are more strongly related to life satisfaction than A values. (2) A traits are more strongly related to life satisfaction than C traits. Moreover, we will test if the relation between C values and life satisfaction is moderated by A traits.

STUDY 1: GERMANY
PARTICIPANTS

We recruited 201 participants (128 women, 73 men; age range from 15 to 72 years; $M = 27.36$, SD $= 12.94$). Most of them had graduated from university (79%). They filled out an online questionnaire.

MATERIALS AND MEASURES

A and C values were assessed with a scale constructed by Trapnell and Paulhus (2012). Participants rated the importance of 20 values on a 7-point scale ranging from 1 = *not important for me* to 7 = *highly important for me*. A values were "autonomy," "competence," "achievement," "ambition," "influence," "power," "status," "wealth," "recognition," and "superiority." C values were "trust," "honesty," "harmony," "civility," "loyalty," "politeness," "compassion," "altruism," "forgiveness," and "equality." The reliabilities of both scales were good (A values, α = 0.85; C values, α = 0.88).

A and C traits were measured by means of 40 bipolar adjective scales (Abele and Hauke, unpublished manuscript). Answers were given on bipolar scales ranging from 2 (*definitely applies to me*) for the left-hand adjective (for instance "efficient") through 0 (*neither – nor*) to 2 (*definitely applies to me*) for the right-hand adjective (for instance "inefficient"). These ratings were later recoded into 5-point scales with 5 being the positive endpoint of the scale (for instance 1 "inefficient" to 5 "efficient"). Further examples for the A scale are "competent" versus "incompetent" and "gives up easily" versus "does not give up easily." Examples for the C scale are "helpful" versus "not helpful" and "fair" versus "unfair." The reliability of both scales was good (A traits, α = 0.87; C traits, α = 0.89).

We measured life satisfaction with a German version of the satisfaction with life scale (Diener et al., 1985; German version Glaesmer et al., 2011). It comprises five items (sample item: "In most ways, my life is close to my ideals"; "So far I have gotten the

things I want in my life") which were answered on a 5-point scale from 1 = *not at all* to 5 = *definitely agree*. The reliability of the scale was good (α = 0.82).

RESULTS AND DISCUSSION

We first conducted a series of confirmatory factor analyses (CFAs) using MPlus (Muthén and Muthén, 1998) to ensure the distinctness of the values and the trait scales. We followed suggestions by Little et al. (2002) and used item parcels for these analyses. Item parcels have better psychometric characteristics than single items and fewer parameters are needed to define a construct. Six item parcels were built for the agency and communion trait measures each. Three parcels were built for the A and C value measures each. Using a maximum likelihood estimation method, the results of the CFA revealed that the four-factor model that distinguishes between A and C values and A and C traits fitted the data [$\chi^2 = 259.20$, $df = 125$, $p < 0.001$; comparative fit index (CFI) = 0.90, Tucker-Lewis Index (TLI) = 0.88, root mean square error approximation (RMSEA) = 0.07, standardized root mean square residual (SRMR) = 0.07; cf., Hu and Bentler, 1999]. Most importantly, this model provided a significant improvement in fit compared to a model with only two factors (A values plus traits versus C values plus traits; $\Delta \chi^2 = 155.96$, $df = 5$, $p < 0.001$)[1]. We therefore used the four scales of A and C values and of A and C traits.

Table 1 shows the means, standard deviations and intercorrelations of the present measures. Women endorsed C values slightly more than men; A traits were positively correlated with age; and participants with higher education scored lower on C traits than participants with lower education. Moreover, older people endorsed A values less than younger ones.

Participants rated their A traits lower than their C traits, $t(200) = 10.83$, $p < 0.001$, $d = 0.78$, and they endorsed A values less than C values, $t(200) = 16.25$, $p < 0.001$, $d = 1.15$. A traits and C traits were significantly correlated, but A values and C values were independent. Life satisfaction was significantly correlated with both the value scales and the trait scales.

In order to test the above hypotheses, we ran a stepwise multiple regression (all variables centered). We first regressed the socio-demographics, then the value scales, then the trait scales and in the fourth step the interaction between A traits and C values (Aiken and West, 1991) on life satisfaction.

The findings are depicted in **Table 2**. Gender, age, and education had no influence on life satisfaction. Supporting H1, C values were significantly associated with life satisfaction, but A values were not. Supporting H2, A traits related positively to life satisfaction and C traits showed no association[2]. The exploratory test for an interaction of C values and A traits revealed no effect.

Summarizing, Study 1 revealed findings in support of our hypotheses. Participants who endorsed C values (H1) and who rated their A traits as high (H2) were especially satisfied with their

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[1]We also tested several three-factor models, but they showed worse fit indices than the four-factor model (all $ps < 0.001$).

[2]The regression of socio-demographics and self-concept (without values) revealed again a highly significant beta weight for A traits (β = 0.38, $p < 0.0001$), but not for C traits (β = 0.08, ns).

Table 1 | Mean, standard deviation, and intercorrelation (Study 1; N = 201).

| | M | SD | Correlation with | | | | | | |
			2	3	4	5	6	7	8
(1) Gender[a]			0.11	−0.04	0.03	−0.12	0.07	−0.15*	−0.07
(2) Age	27.36	12.94		−0.11	0.18*	0.01	−0.15*	−0.08	0.03
(3) Education[b]					0.02	−0.16*	0.12	−0.09	0.11
(4) Agentic traits[c]	3.63	0.50				0.33***	0.39***	0.16*	0.40***
(5) Communal traits[c]	4.06	0.48					−0.03	0.68***	0.20**
(6) Agentic values[d]	4.31	0.99						0.05	0.15*
(7) Communal values[d]	5.77	0.86							0.21**
(8) Life satisfaction[c]	3.68	0.81							

[a] 0 woman, 1 man; [b] 0 lower than high school, 1 high school and more; [c] scale from 1 to 5; [d] scale from 1 to 7; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.

lives. Our exploratory test for a moderation of the effects of C values via A traits revealed no effect.

Moreover, participants rated their C traits higher than their A traits. This is the usual finding in the literature (see Abele and Wojciszke, 2014, for an overview). Also in support of findings in the literature (Trapnell and Paulhus, 2012), they endorsed C values more than A values. It may be asked why older participants rated their A traits higher than younger ones. We think that this is due to the sample as we had only few participants above the age of 50 ($N = 13$), i.e., the "older" participants were "middle-aged." There are also findings in the literature suggesting a positive association between persistence (belonging to the A domain) and age (Josefsson et al., 2013).

STUDY 2: RUSSIA

PARTICIPANTS AND MEASURES
We recruited 328 participants (213 women, 115 men; age range from 15 to 66 years; $M = 27.93$, SD $= 9.34$). Most of them had

graduated from university (87%). They filled out an online questionnaire. The measures were the same as in the first study. The reliabilities of the scales were good (A traits, $\alpha = 0.88$; C traits, $\alpha = 0.83$; A values, $\alpha = 0.87$; C values, $\alpha = 0.86$; life satisfaction, $\alpha = 0.81$).

RESULTS AND DISCUSSION
We again conducted a series of CFAs with the analogous item parcels as in Study 1. The four-factor model (A and C values and A and C traits) fitted the data adequately ($\chi^2 = 424.64$, $df = 125$, $p < 0.001$; CFI $= 0.89$, TLI $= 0.86$, RMSEA $= 0.09$, SRMR $= 0.08$). This model provided a significant improvement in fit compared to a model with only two factors (A values plus traits versus C values plus traits; $\Delta\chi^2 = 529.25$, $df = 5$, $p < 0.001$)[3]. We therefore again used the four scales of A and C values and of A and C traits.

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[3]We also tested several three-factor models, but they showed worse fit indices than the four-factor model (all ps < 0.001).

Table 2 | Socio-demographic variables, values, and self-concept regressed on life satisfaction (Study 1; N = 201).

	First step β, SE	Second step β, SE	Third step β, SE	Fourth step β, SE	Final model overall adjusted R²
Gender	−0.07 (0.12)	−0.05 (0.12)	−0.05 (0.11)	−0.05 (0.11)	
Age	0.05 (0.01)	0.08 (0.01)	−0.02 (0.01)	−0.01 (0.00)	
Education	0.11 (0.14)	0.12 (0.14)	0.11 (0.13)	0.11 (0.13)	
Agentic values		0.14 (0.06)	−0.03 (0.06)	−0.01 (0.06)	
Communal values		0.21*** (0.07)	0.18* (0.09)	0.19* (0.09)	
Agentic traits			0.40*** (0.13)	0.40*** (0.13)	
Communal traits			−0.05 (0.16)	−0.02 (0.17)	
A traits * C values				0.10 (0.05)	0.17***
Δ R²	0.00	0.06**	0.12***	0.01	

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

Table 3 | Mean, standard deviation, and intercorrelation (Study 2; *N* = 328).

| | *M* | *SD* | Correlation with | | | | | | |
			2	3	4	5	6	7	8
(1) Gender[a]			–0.07	–0.09	0.07	–0.13**	–0.07	–0.21***	–0.12*
(2) Age	27.93	9.34		0.21***	0.14**	0.06	–0.25***	0.11*	0.20***
(3) Education[b]					0.11*	0.08	0.00	.08	0.05
(4) Agentic traits[c]	3.57	0.52				0.40***	0.30***	0.18***	0.36***
(5) Communal traits[c]	4.01	0.42					0.09	0.57***	0.35***
(6) Agentic values[d]	4.70	1.06						0.17**	0.06
(7) Communal values[d]	5.68	0.86							0.22***
(8) Life satisfaction[c]	2.98	0.87							

*[a] 0 woman, 1 man; [b] 0 lower than high School, 1 high school and more; [c] scale from 1 to 5; [d] scale from 1 to 7; *p < 0.05; **p < 0.01; ***p < 0.001.*

Table 3 shows the mean, standard deviation, and inter-correlation. Women scored higher on C traits and higher on C values than men; women were also more satisfied with their lives than men. Older people scored higher on A traits, they were more satisfied with their lives, and they endorsed A values less than younger people. People with higher education scored higher on A traits than people with lower education.

Participants again scored lower on A traits than on C traits, $t(327) = 15.19$, $p < 0.001$, $d = 0.86$, and they endorsed A values less than C values, $t(327) = 14.20$, $p < 0.001$, $d = 0.72$. A traits and C traits were significantly correlated and A values and C values were also slightly correlated. Life satisfaction was significantly correlated with both A traits and C traits and with C values, but not with A values.

The hypotheses were again tested by means of a stepwise multiple regression. The variables were centered before entering them into the regression (**Table 4**). In the Russian sample women and older people were more satisfied with their lives than men and younger people. Supporting H1, C values were significantly associated with life satisfaction (second step). However, the influence

of C values disappeared, when the trait measures were introduced in step three. Now both A and C traits significantly related to life satisfaction[4]. Step four, finally, revealed a significant interaction of A traits and C values. As can be seen in **Figure 1**, the impact of C values on life satisfaction was moderated by A traits. Participants high in A traits were generally more satisfied than those low in A traits. C values had an impact on life satisfaction especially when participants were high in A traits.

Summarizing, H1 was again supported: C values were positively associated with life satisfaction. However, as the significant interaction with A traits showed this effect was moderated by A traits. C values were more closely associated with life satisfaction when A traits were high. Supporting H2, A traits were generally positively associated with life satisfaction.

Replicating Study 1, participants rated their C traits higher than their A traits; and they endorsed C values more than A values.

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[4]The regression of socio-demographics and self-concept (without values) revealed highly significant beta weights for both A traits ($\beta = 0.27$, $p < 0.001$) and C traits ($\beta = 0.22$, $p < 0.001$).

Table 4 | Socio-demographic variables, values, and self-concept regressed on life satisfaction (Study 2; *N* = 328).

	First step β, *SE*	Second step β, *SE*	Third step β, *SE*	Fourth step β, *SE*	Final model Overall adjusted R²
Gender	–0.11* (0.10)	–0.07 (0.10)	–0.11* (0.09)	–0.12* (0.09)	
Age	0.19** (0.01)	0.20** (0.01)	0.14** (0.01)	0.13* (0.01)	
Education	0.00 (0.14)	–0.01 (0.14)	–0.04 (0.13)	–0.06 (0.13)	
Agentic values		0.08 (0.05)	–0.02 (0.05)	–0.01 (0.05)	
Communal values		0.18*** (0.05)	0.02 (0.06)	0.07 (0.06)	
Agentic traits			0.27*** (0.10)	0.30*** (0.10)	
Communal traits			0.21** (0.14)	0.19** (0.13)	
A traits * C values				0.18*** (0.04)	0.23***
Δ R²	0.05**	0.04**	0.13***	0.03*	

*p < 0.05; **p < 0.01; ***p < 0.001.*

FIGURE 1 | Interaction of C values and A Traits on life satisfaction (Study 2; Russia; Low: ≤one SD below mean; High: ≥one SD above mean).

FIGURE 2 | Life satisfaction in Study 1 (Germany) and Study 2 (Russia) dependent on below versus above Median C Values and A traits.
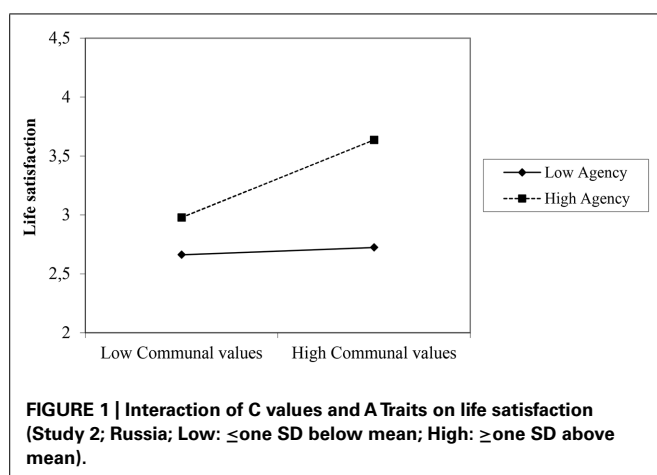
Also replicating Study 1, older people rated their A traits higher than younger people. However, there were again only few people above the age of 50 ($N = 9$). Whereas the socio-demographic variables had no influence in the German sample, the Russian sample revealed higher life satisfaction of women and older people.

COMPARISON BETWEEN BOTH STUDIES

We compared the trait-, value-, and life satisfaction measures between both samples. Russians and Germany did not differ in their trait ratings [A traits: $t(527) = 1.26$, *ns*; C traits: $t(527) = 1.29$, *ns*] as well as in C values [$t(527) = 1.23$, *ns*]. However, life satisfaction was higher in the German sample, $t(527) = 9.15$, $p < 0.001$; $d = 0.82$; and A values were higher in the Russian sample, $t(527) = 4.26$, $p < 0.001$; $d = 0.38$[5].

We also compared the correlations between values and traits across the studies. A values and A traits correlate significantly (Germany: $r = 0.39$, $p < 0.001$; Russia: $r = 0.30$, $p < 0.001$), but C values and C traits correlate even more (Germany: $r = 0.68$, $p < 0.001$; Russia: $r = 0.57$, $p < 0.001$).

Figure 2, finally, summarizes the findings for our main hypotheses. In both samples we analyzed life satisfaction dependent on the individuals' below versus above median A traits and dependent on their below versus above median C values. As **Figure 2** shows, the high/high group was always more satisfied than the middle group, which was more satisfied than the low/low group. The comparisons between these groups were highly significant[6].

DISCUSSION
GENERAL FINDINGS
The present research studies the joint impact of values and traits on an individual's life satisfaction. We have argued that values as motivational forces influence the direction of behavior and goals;

and that traits should influence the effort and efficiency with which an individual strives for certain values and pursues certain goals. We applied the A & C framework to the analysis of va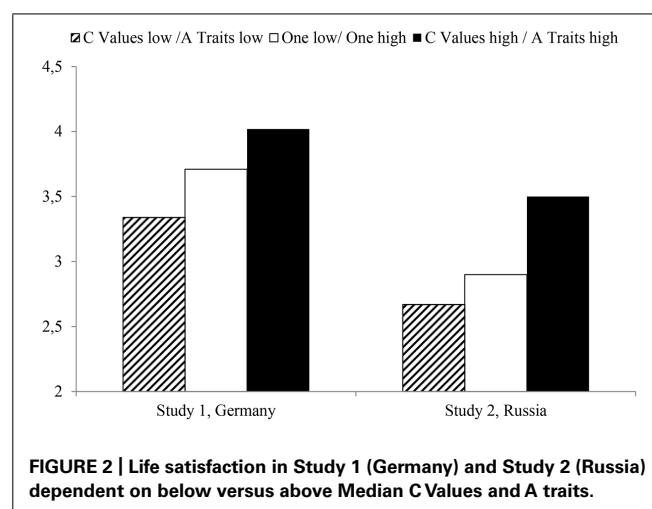lues and traits and distinguished between A and C values (Trapnell and Paulhus, 2012) and between A and C traits (Abele and Wojciszke, 2007, 2014). We predicted that C values and A traits would be related to life satisfaction. We also tested if the association between C values and life satisfaction is moderated by A traits. The hypotheses were supported in the German sample and they were mainly supported in the Russian sample.

Supporting H1, C values were in both samples positively associated with life satisfaction. Whereas this was a general influence in the German sample, in the Russian sample the impact of C values was moderated by A traits. These findings are in line with our theoretical reasoning. C values add to life satisfaction once, because they are regarded as more important across cultures (in both samples C values were more endorsed than A values); and also because they are "intrinsically" rewarding (Kasser and Ryan, 1996; Kasser et al., 2014). A values had no influence on life satisfaction, and this finding was the same across both studies (cf. Hofer et al., 2006; Dunn et al., 2012). It is again in line with self-determination theory as A values are more related to "extrinsic" goals (Kasser and Ryan, 1996; Kasser et al., 2014). Moreover, A values are culturally less appreciated than C values (Myers and Diener, 1995).

Supporting H2, A traits were significantly associated with life satisfaction in both samples. Individuals high in A traits are self-confident and efficient – whatever goal or value they strive for. They are success-oriented and successful. In this context, self-confidence, self-efficacy, and self-esteem as well as success enhance a person's life satisfaction (Helgeson, 1994; Abele et al., 2008a; Hefferon and Boniwell, 2011; Bi et al., 2013).

As was shown in **Figure 2**, individuals with above median C values and above median A traits were always more satisfied than individuals in the middle group (either C values or A traits below median) than those in the low/low group (individuals with below median C values and below median A traits).

The impact of A traits on life satisfaction was higher than the impact of C values; suggesting that not values *per se* impact a

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[5]Russians scored higher on eight of the A values (autonomy, competence, achievement, wealth, recognition, status, power, and superiority). There was no difference regarding the value of influence. Conversely, Germans scored higher on ambition.

[6]Overall F-test: Germany, $F(2,198) = 11.11$, $p < 0.001$; Russia, $F(2,325) = 26.14$, $p < 0.001$. Duncan-tests between groups always $p < 0.05$. Difference high/high versus low/low in Germany: Cohen's $d = 0.93$; in Russia: Cohen's $d = 1.04$.

person's life satisfaction, but the transformation of values into behavior is important. Consequently, beliefs in one's own competence and assertiveness, that is, A traits, foster the transformation of values into behavior. Most importantly, the present data showed that the efficient pursuit of goals enhances life satisfaction when these goals are related to C values, such as, trust, honesty, altruism, forgiveness, and equality[7]. These findings are an addition to earlier research in which either A traits or the endorsement of C values was related to life satisfaction (e.g., Helgeson, 1994; Kasser and Ryan, 1996; Saragovi et al., 2002; Locke, 2003; Hofer et al., 2006; Dunn et al., 2012; Kasser et al., 2014).

The relatively strong association of A traits with life satisfaction was shown in both Germany and Russia. This intercultural finding supports our theoretical reasoning that a person's agency being indicative of competence- and efficiency beliefs enhances effort-expenditure and optimism in goal striving and that these factors add to a person's life satisfaction. The present research also adds to our understanding of the A & C framework in personality and social psychology. The data show that C traits and C values were more endorsed than A traits and A values. These findings are in line with prior reasoning and data on the primacy of communion (Abele and Bruckmüller, 2011; Abele and Wojciszke, 2014).

Moreover, the present results show that C values and C traits are more strongly correlated than A values and A traits; thus, supporting a "primacy of communion" not only in ratings of the self and of others, but also at the construct level. Communal content is more similar across languages than agentic content (Abele et al., 2008b; Abele and Bruckmüller, 2011; Abele and Wojciszke, 2014) and within a language it is more closely connected ("denser") than agentic content (Bruckmüller and Abele, 2013).

COMPARISON BETWEEN BOTH COUNTRIES

In contrast to the German sample, in which C traits showed no association to life satisfaction when A traits were controlled for, C traits were associated with life satisfaction in the Russian sample even when A traits were controlled for. As collectivism and femininity are more pronounced in the Russian culture than in the German culture (Hofstede, 2001), an individual's C traits in the sense of warmth, friendliness and helpfulness might add more to life satisfaction in Russia than in Germany (for differences within China; Bi et al., 2013).

There are also both similarities and differences between the countries. Whereas in both samples women endorsed C values more than men, there were no further gender differences in the German sample but two more ones in the Russian sample. In the Russian sample women scored higher on C traits than men. This may be due to more traditional gender roles in Russia than in Germany (Fuwa, 2013). Russian women were also more satisfied with their lives than Russian men. However, gender did not moderated the association between self-concept, values and life satisfaction.

In both samples older participants rated their A traits higher than younger ones, and in both samples participants with higher education scored higher on A traits than those with lower education. These findings, however, should be replicated as there were only few older participants and only few less well educated participants in both samples.

It is not astonishing that life satisfaction of the German sample was higher than life satisfaction of the Russian sample, as Germany is a wealthier and safer country than Russia. It is more astonishing that A values were higher in the Russian sample than in the German one – given that Russia was classified as a less masculine country than Germany (Hofstede, 2001; http://geert-hofstede.com/germany.html) and that masculinity and A values share some common meaning (Abele and Wojciszke, 2007). One interpretation may be that the daily struggle for better living conditions is harder in Russia and that this experience leads to higher A values. Given the classification of Russia as less masculine and more collectivistic than Germany it is also astonishing that both samples did not differ in their trait ratings.

LIMITATIONS

There are some limitations of the present research which should be addressed in future studies. First, our samples comprised mainly highly educated individuals. Albeit the present data did not show a moderating impact of level of education, the samples comprised nevertheless mainly highly educated individuals. The impact of education should be further studied. Second, our data are cross-sectional and it has to be demonstrated if A traits and C values influence life satisfaction in a longitudinal perspective. We are, however, confident that the present data do have some validity as they were replicated across two different countries. Third, it may be argued that Russia and Germany do not differ so much and that a better test of the cultural invariance of the present findings would be to involve countries which are more different like, for instance, China or Japan. Again, this is an issue for further research. Finally, it might be argued that the measures of A and C values as well as A and C traits were highly correlated and it is not clear if they really measure different constructs. We think that even though the measures were correlated we showed that a four-factorial model covers the data better than a two-factorial model (or any three-factorial model) and we also showed that values and traits are differentially related to life satisfaction. Hence, suggesting that the constructs of A and C values and A and C traits are sufficiently distinct (see also Parks-Leduc et al., 2014) even though the model fits in the CFA's were not fully satisfactory.

CONCLUSION

The present research adds to our understanding of individual differences underlying differences in life satisfaction. Values as the cognitive representation of motives are important. However, not all kind of values add to life satisfaction: in both present samples C values add to life satisfaction especially when people are convinced that they are "agentic" enough to pursue and live these values.

ACKNOWLEDGMENTS

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[7]It might be argued that the effective pursuit of any value enhances life satisfaction. We therefore additionally tested if the interaction of A traits and A values is significant. However, in both samples, there was no interaction.

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Satisfaction with life and character strengths of non-religious and religious people: it's practicing one's religion that makes the difference

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According to systematic reviews, religious beliefs and practices are related to higher life satisfaction, happiness, and positive affect (Koenig and Larson, 2001). The present research extends previous findings by comparing satisfaction with life and character strengths of non-religious people, religious people, who practice their religion and people that have a religious affiliation but do not practice their religion. We assessed life satisfaction (SWLS), character strengths (VIA-IS) and the orientations to happiness (OTH) in a sample of $N = 20538$ participants. People with a religious affiliation that also practice their religion were found to be more satisfied with their life and scored higher on life of meaning than those who do not practice their religion and than non-religious people. Also religious people who practice their religion differed significantly from those who do not practice their religion and non-religious people regarding several character strengths; they scored higher on kindness, love, gratitude, hope, forgiveness, and on spirituality. There were no substantial differences between people who had no religious affiliation and those with a religious affiliation that do not practice their religion (all $\eta_p^2 s < 0.009$). Altogether, the present findings suggest that people profit from a religious affiliation if they also actively practice their religion.

Keywords: character strengths, religiousness, satisfaction with life, orientations to happiness, practicing religion

INTRODUCTION

SATISFACTION WITH LIFE AND RELIGION

One pertinent research question in Positive Psychology is the identification of variables that enable a fulfilling, meaningful, and happy life. In the past years a sizable amount of studies has been accumulated to examine the relation of character strengths and well-being (e.g., Isaacowitz et al., 2003; Park et al., 2004). It was consistently found that life satisfaction is particularly related to the five following scales of the *Values in Action Inventory of Strengths* (VIA-IS; Peterson and Park, 2004; Peterson et al., 2005a): *curiosity, zest, love, gratitude,* and *hope*.

Reviewing previous studies using the VIA-IS, we found no consistent pattern regarding the relation of life satisfaction and the strength religiousness, which is defined as having coherent beliefs about the higher purpose and meaning of the universe, knowing where one fits within the larger scheme. Correlation coefficients vary from significantly negative (e.g., $r = -0.14$; Karris, 2009) to positive (e.g., $r = 0.32$; Peterson et al., 2007). Yet, the inconsistency of these results is not surprising. Numerous studies already examined the relation of religiousness and mental health, psychological distress, and other variables related to well-being using a variety of measures for the assessment of religiousness (see Saroglou, 2014, for a review). On the one hand, researchers concluded that the relation is weak and negative (Batson et al., 1993; Ellison and Lee, 2010), on the other hand, systematic meta-analyses point in the other direction (Koenig and Larson, 2001; Smith et al., 2003). The aim

of the present research is to identify a condition under which a positive influence of religiousness on life satisfaction can be expected.

One reason for the discrepancy among previous studies (using the VIA-IS) might be the variation of unnoticed, but important, third variables (e.g., a social norm or the exertion of religious behaviors). Recently, Stavrova et al. (2013) showed that religious people are happier and more satisfied with life than non-religious individuals especially in countries with a positive social norm toward religiousness (see also Gebauer et al., 2012). The influence of such a social norm could be multifaceted. Aside from feeling socially supported, the perceived fit between religious values and environment could encourage religious people to engage in practicing their religion more actively, which in turn could lead to more satisfaction with life.

It is assumed that the use of one's strengths is fulfilling and that well-being is enhanced via the development of one's signature strengths (i.e., participants top five strengths). A number of studies applying strengths-intervention programs provide evidence for an increase in well-being after the strengths-based intervention (Seligman et al., 2005; Rust et al., 2009; Proctor et al., 2011; Gander et al., 2013; Rashid, in press). The findings of Harzer and Ruch (2013) also support this reasoning by showing that job satisfaction increased along with increasing numbers of signature strengths applicable at the workplace. Aside from research using the VIA-IS, Sagiv and Schwartz (2000) provide evidence that well-being is fostered when there is congruence between individuals'

values and their environment. They argue: "people are more likely to experience positive well-being when they can express and fulfill their values ..." (p. 186). According to this theorizing – and in line with previous results – religious individuals should be more satisfied with their lives when they also practice their religion.

But, are prayers really necessary? Sethi and Seligman (1993) analyzed nine different religions and found a positive relation between religiousness and hope as well as optimism. Their analyses revealed that the liturgy (i.e., religious material) plays an important role. Other relevant factors positively related to optimism were religious influence in daily life, religious involvement and religious hope (see also Ciarrocchi et al., 2008). Further evidence for the influence of prayers can be found in a study of Mochon et al. (2008) focusing on the frequency of religious practice. The authors suggest that regular activities (e.g., attending religious services) can provide people with small positive boosts. The findings showed that well-being was more positive, the more often religion was practiced. However, the same authors also concluded that the relationship between religiousness and well-being is more complex than they had thought (Mochon et al., 2011). They found that people who claim to be religious only to a small extent are less happy than non-believers.

Additional support for our hypothesis that a religious affiliation alone does not automatically lead to higher life satisfaction is provided by Salsman et al. (2005). They showed that extrinsic religiousness had no influence on satisfaction with life, while intrinsic religiousness and prayer fulfillment was positively related to life satisfaction. Also, Lambert et al. (2009) showed in a set of studies that praying could increase gratitude (one of the strengths that is strongly related to life satisfaction).

Summing up – and in accordance with previous results – we hypothesized that satisfaction with life is increased in religious people who practice their religion compared to religiously affiliated people that do not practice their religion. This latter group was expected to be as satisfied with their lives as people without a religious affiliation.

CHARACTER STRENGTHS AND RELIGION

The inspection of historical texts across different cultures and religions enabled researchers to identify six ubiquitous virtues (Dahlsgaard et al., 2005). Later, 24 character strengths were derived that enable the virtues: creativity, curiosity, open-mindedness, love of learning, perspective, authenticity, bravery, perseverance, zest, kindness, love, social intelligence, fairness, leadership, teamwork, forgiveness, humility, prudence, self regulation, appreciation of beauty and excellence, gratitude, hope, humor, and religiousness (Peterson and Seligman, 2004).

Studying religions had been particularly important for the creation of the list of character strengths. However, studies that directly investigate the influence of being religious or practicing religion on character strengths are fairly scarce in positive psychology research. Moreover, those few studies comparing religious and non-religious individuals that use the VIA-IS yielded contradictory results. Bai (2011, Unpublished Doctoral dissertation) for example found no differences between individuals with and without a religious denomination. Ahmed (2009), on the other hand,

showed that various character strengths depended on the individual's religiousness. The inconsistency of previous results calls for more research to shed light on the manifold influences of religion on character strengths. The present research aims to contribute to the understanding of this relationship.

There are several possibilities available to generate hypotheses regarding religiousness and character strengths. Reviewing religious readings is a helpful alternative to collect exploratory hypotheses and it becomes apparent that religious norms are related to quite a few character strengths, as for example *gratitude, kindness,* and *forgiveness.* The rules of gratitude, kindness and forgiving are omnipresent lessons taught through religious readings and services. A relationship between these strengths and religiousness has also already been reported in previous research. There is for example empirical evidence that praying increases gratitude (Lambert et al., 2009). Thus, the character strength *gratitude* should be particularly increased in religious people that practice their religion. The strength gratitude was also included in research of Ahmed (2009), who showed that highly religious participants (i.e., American Muslim youth) were characterized by the strengths: kindness, equity, leadership, self-regulation, prudence, gratitude, hope/optimism, spirituality, and forgiveness. We therefore assume that these strengths are increased in religious people particularly when they practice their religion.

Another aid in the generation of hypotheses regarding character strengths is to examine the literature on values and religiousness. A meta-analysis based on data of the Schwartz value survey revealed that religious people favor conservative values such as tradition, conformity and tend to dislike hedonism (Saroglou et al., 2004). However, a differential investigation of the facets of religiousness showed a more complex picture. Saroglou and Munoz-Garcia (2008) showed that the preference for different values varied depending on which facet of religiousness was being considered. Religiosity was positively associated with conformity, while spirituality and conformity were unrelated. All religiousness measures, however, were positively related to the value of benevolence. The value benevolence, in a way, corresponds to the strengths forgiveness and kindness. Thus, the findings regarding values and religiousness support our assumption that peoples' character strengths (especially *kindness* and *forgiveness*) vary depending on their religiousness.

ORIENTATIONS TO HAPPINESS AND RELIGION

According to Seligman (2002), people can take three different roads to achieve happiness. The pleasurable route to happiness is characterized by a *hedonistic* worldview – accentuating the quest for pleasure and avoidance of pain (Peterson et al., 2005b). The second orientation to happiness is the life of engagement, which is based on Csikszentmihalyi's (1990) concept of flow. Through engaging in an activity, people can become absorbed, and receive gratification from these actions. In addition to pleasure and engagement, there is a third route to happiness: the life of meaning. This third route emphasizes that people can obtain happiness by identifying one's virtues and by living in accordance with this virtues to accomplish a higher purpose in life.

Previous research on the three orientations to happiness (OTH) showed that religious people differ regarding the two orientations

pleasure and meaning (Ruch et al., 2010a). Life of meaning was found to be higher in religious people, while, in contrast, pleasure appears to be negatively related to religiousness (see also Peterson et al., 2007). In line with previous findings, we expected that religious individuals would score high on meaning and low on pleasure. Support for the latter hypothesis can be partly derived from research on values and religion, showing that hedonism is less appreciated in religious people (Saroglou et al., 2004). However, research addressing religion and the OTH in more detail is lacking. Thus, we analyzed pleasure, engagement and meaning of religious people – in particular of those who practice their religion.

Altogether, the present research examines the relation of religiousness and the variables that define "the good life" – character strengths, satisfaction with life and the OTH. Comparing non-religious individuals with religiously affiliated individuals who either do practice vs. do not practice their religion, it was predicted that individuals who indicated that they practiced their religion would score higher on life satisfaction and would also differ substantially from the other respondents regarding character strengths and OTH (especially life of meaning).

MATERIALS AND METHODS
PARTICIPANTS
The sample consisted of 20538 German-speaking respondents. About 56% of the participants were from Germany, 31% were Swiss and 10% were from Austria. The respondents had a mean age of 39 years (SD = 12.39) with a range across the adult years. There were more female (70%, $n = 14375$) than male participants. About 48% ($n = 9848$) participants of our sample were married or in a relationship, <40% ($n = 7999$) were single, 12% ($n = 2442$) were separated or divorced, and ca. 1% ($n = 249$) were widowed. One third of our participants ($n = 6168$) were living alone, more than 50% ($n = 10472$) were living together with their partner or marriage partner, 9.4% ($n = 1938$) were living in a flat-sharing community, and 9.5% ($n = 1960$) were living together with their parents.

Almost 80% ($n = 16210$) of our participants reported themselves to be employed. About 57% ($n = 11625$) had a university degree, 20% ($n = 4154$) reported the completion of primary, required education, 13% ($n = 2606$) had a baccalaureate, 10% ($n = 2077$) of them had completed an apprenticeship, and <1% ($n = 76$) left school after the primary level.

INSTRUMENTS
Religious affiliation and practice of religion
One single item was used to assess participants' religious denominations. 25.5% of the participants indicated themselves to have no religious affiliations ($n = 5235$), the other 74.5% ($n = 15303$) were religiously affiliated. Next, we assessed whether participants practiced their religion or not with one item: "Do you practice your religion?" (1 = yes, 2 = no, 3 = no religion). 30% of the participants indicated to practice their religion ($n = 6165$) and 44.5% did not practice their religion ($n = 9138$).

Twenty-six percent of the female and 24% of the male participants were not religiously affiliated. Approximately 31% of

the female sample and 28% of the male participants indicated to practice their religion and 43% of the female participants vs. 48% of the males had a religious affiliation but did not practice their religion. According to Cramérs V ($\varphi_c = 0.04$), there appears to be no meaningful relationship between gender and religious participation.

Values in action inventory of strength (VIA-IS)
The Values in Action Inventory of Strengths (VIA-IS; Peterson et al., 2005a) consists of 240 items for the self-assessment of the 24 character strengths (10 items per strength) included in the classification of Peterson and Seligman (2004). The questionnaire uses a 5-point Likert-scale (*very much like me* to *very much unlike me*). Example items are "*I believe in a universal power, a god.*" (*religiousness*), "*I have voluntarily helped a neighbor in the last month.*" (*kindness*), "*I never miss group meetings or team practices.*" (*teamwork*), "*I try to respond with understanding when someone treats me badly.*" (*forgiveness*). We used the German translation (Ruch et al., 2010b) of the VIA-IS that has comparable psychometric properties to the US-version. It has been used in numerous studies (e.g., Müller and Ruch, 2011; Proyer et al., 2011; Güsewell and Ruch, 2012). In the present sample the alpha coefficients were between α = 0.71 (*authenticity*) and α = 0.90 (*religiousness*) with a median of α = 0.78.

Orientations to happiness scale
The OTH Scale (Peterson et al., 2005b) is a self-report questionnaire for the assessment of the three OTH (Life of Pleasure, Life of Engagement, Life of Meaning). The questionnaire uses a 5-point Likert-scale (*very much unlike me* to *very much like me*) and consists of 18 items (each scale is measured with six items). A sample item for the assessment of life of engagement is "*Regardless of what I am doing, time passes very quickly.*" We used the German version of the OTH (Ruch et al., 2010b) that has shown good psychometric properties in several studies (e.g., Proyer et al., 2012). In the present sample the alpha coefficients of the three scales of the OTH were α = 0.74 (*pleasure),* α = 0.65 (*engagement*), and α = 0.78 (*meaning*).

Satisfaction with life scale
The Satisfaction with Life Scale (SWLS; Pavot and Diener, 2008) is a 5-item measure that is widely used in research for the assessment of life satisfaction (as a global cognitive judgment of one's own life). The scale showed good psychometric properties across several studies (e.g., Diener et al., 2000). We used the German translation of the scale that has shown equally good psychometric properties (e.g., Peterson et al., 2007; Ruch et al., 2010b). A sample item is "*The conditions of my life are excellent.*" It uses a 7-point answer format (ranging from *strongly disagree* to *strongly agree*). The SWLS had a high internal consistency in our sample (α = 0.87).

PROCEDURE
The respondents completed all three questionnaires (VIA-IS, OTH, SWLS) via the German online platform: www.charakterst aerken.org. They registered, provided socio-demographic information, and completed the measures sections. None of the

participants was paid. Immediately after completion, all participants received individualized feedback on their results. Though data collection via the Internet is sometimes criticized, there are empirical studies showing that Internet-based studies are usually as reliable and valid as more traditional strategies (e.g., paper–pencil) and that web-based samples are usually more diverse than other samples (Gosling et al., 2004; Howell et al., 2010). All local ethical guidelines were fulfilled.

RESULTS

Given the size of our sample, any two means that differed by 0.02 or more were statistically different ($p < 0.05$). Thus, we decided to consider and refer to the effect sizes (i.e., η_p^2) when reporting effects. By applying this strategy, we aimed to reduce the risk of overestimating the differences between our comparison groups (i.e., non-religious individuals, religiously affiliated individuals who practice their religion and not practice their religion). Effect sizes $\eta_p^2 s$ of ≥ 0.01 were considered as indicative.

RELIGIOUSNESS, PRACTICING RELIGION, AND SATISFACTION WITH LIFE

To compare the life satisfaction of non-religious participants, religiously affiliated participants, who practice their religion and those who not practice their religion, we conducted a univariate ANOVA (analysis of variance) with the dependent variable "satisfaction with life" and the independent factor group (religious and practicing, religious and not practicing, non-religious individuals). The means and standard deviations are reported in **Table 1**. The effect sizes indicated that, as predicted, religious people, who practice their religion, reported a higher satisfaction with life than their counterparts, who did not practice their religion and also a higher life satisfaction than non-religious individuals. There was no substantial difference between non-religious individuals and religiously affiliated participants, who did not practice their religions (see **Table 2** for F-values and effect sizes).

RELIGIOUSNESS, PRACTICING RELIGION, AND CHARACTER STRENGTHS

For the comparison of the three groups regarding the character strengths, we conducted a MANOVA with the 24 strengths as dependent variables and the independent factor group (religious and practicing, religious and not practicing, non-religious individuals). The religious individuals, who practiced their religion, scored higher than the other two comparison groups on 16 of the 24 strengths (i.e., curiosity, love of learning, persistence, zest, love, kindness, teamwork, leadership, forgiveness, modesty, prudence, self-regulation, appreciation of beauty, gratitude, hope, and religiousness). The most pronounced differences were found for religiousness (large effect), gratitude (medium effect), love, forgiveness, hope, kindness, and appreciation of beauty (all $\eta_p^2 s > 0.011$, see **Tables 1** and **2**). The comparison of non-religious individuals and religiously affiliated individuals, who do not practice their religion, showed no substantial differences regarding the 24 character strengths (all $\eta_p^2 s < 0.01$).

RELIGIOUSNESS, PRACTICING RELIGION, AND ORIENTATIONS TO HAPPINESS

We compared pleasure (P), engagement (E), and meaning (M) of non-religious participants, religiously affiliated participants, who practice their religion and those who did not practice religion. The MANOVA with the three scales of the OTH (P, E, and M) showed that religious individuals, who practice their religion, scored higher on meaning and lower on pleasure than the other two groups, which did not differ from each other (see **Tables 1** and **2**). No substantial differences were found for engagement.

DISCUSSION

The aim of the present research was to examine how practicing religion relates to variables that designate the "good life". Therefore, we investigated whether religiously affiliated individuals, who practice vs. those who do not practice their religion and non-religious individuals, differed with regard to their satisfaction with life, their character strengths and their OTH.

The findings of our study show that satisfaction with life was, as predicted, higher in individuals, who reported to practice their religion compared to the other respondents. Moreover, those individuals who are members of a religious community but do not practice their religion, did not differ from non-religious individuals regarding their life satisfaction. Apparently, people do not benefit from being religiousness unless they also engage in practicing their religion actively. The present results fit well with the findings of previous studies on religiousness and well-being that already noted the importance of carrying out religious practices (e.g., Sethi and Seligman, 1993; Mochon et al., 2008). The results of the present study are also in line with positive psychological research supporting the notion of a positive relationship between the frequent usage of one's strengths, fulfillment and satisfaction with life (e.g., Seligman et al., 2005).

In terms of religiousness and practicing religion, the processes leading to a high degree of well-being in religious people might be multifaceted. It is possible that religiousness has an indirect influence on life satisfaction through people's dispositional forgiveness. Forgiveness has been shown to correlate with religiousness and satisfaction with life (McCullough et al., 2001; Brown and Phillips, 2005; Jones, 2006). The findings of Brown and Phillips (2005) also indicate that forgiveness is positively related to mental health. Delle Fave et al. (2013) argue that most religious systems recommend healthy lifestyles and cite various studies that provided evidence for the beneficial influence of religiousness (e.g., religious practice) on mental and physical health (see Delle Fave et al., 2013, for an overview). Powell et al. (2003) investigated the relationship between religiousness and mortality. They reviewed several studies and concluded that practicing religion (e.g., church attendance) reduced mortality. Chida et al. (2009) reported similar results. Altogether, practicing religion seems to influence people's well-being directly as well as indirectly via different mechanisms.

Regarding the relation of religion and character strengths, the findings reported herein showed that individuals, who

Table 1 | Reliabilities of the VIA-IS-scales, SWLS, OTH, and descriptive statistics of the three groups.

	α	Religiously affiliated and practicing individuals		Religiously affiliated and not practicing individuals		Non-religious individuals	
		M	SD	*M*	SD	*M*	SD
Creativity	0.88	3.58	0.65	3.51	0.66	3.60	0.65
Curiosity	0.81	4.03	0.51	3.91	0.56	3.95	0.55
Open-mindedness	0.80	3.86	0.47	3.84	0.49	3.89	0.48
Love of learning	0.83	3.92	0.57	3.82	0.60	3.92	0.58
Perspective	0.77	3.59	0.48	3.55	0.50	3.56	0.49
Bravery	0.77	3.61	0.53	3.52	0.55	3.60	0.54
Persistence	0.86	3.53	0.60	3.41	0.64	3.42	0.65
Honesty	0.71	3.84	0.44	3.79	0.44	3.79	0.44
Zest	0.80	3.66	0.56	3.55	0.59	3.53	0.60
Love	0.78	3.92	0.51	3.77	0.57	3.74	0.58
Kindness	0.73	3.91	0.47	3.80	0.48	3.78	0.48
Social intelligence	0.76	3.74	0.46	3.69	0.49	3.68	0.50
Teamwork	0.75	3.68	0.47	3.58	0.48	3.52	0.50
Fairness	0.76	3.95	0.46	3.89	0.48	3.86	0.47
Leadership	0.76	3.68	0.48	3.59	0.48	3.56	0.49
Forgiveness	0.80	3.61	0.54	3.48	0.54	3.47	0.56
Modesty	0.78	3.29	0.58	3.21	0.57	3.14	0.57
Prudence	0.73	3.40	0.53	3.32	0.54	3.31	0.54
Self-regulation	0.74	3.26	0.56	3.14	0.58	3.16	0.58
Appreciation of beauty	0.75	3.72	0.53	3.57	0.56	3.60	0.57
Gratitude	0.81	3.91	0.51	3.62	0.53	3.62	0.56
Hope	0.83	3.64	0.59	3.49	0.64	3.46	0.65
Humor	0.86	3.66	0.61	3.65	0.61	3.63	0.61
Religiousness	0.90	3.78	0.66	2.61	0.75	2.51	0.82
SWLS	0.87	4.86	1.20	4.65	1.26	4.55	1.31
OTH – pleasure	0.74	3.23	0.71	3.38	0.70	3.38	0.70
OTH – engagement	0.65	3.16	0.63	3.08	0.64	3.07	0.65
OTH – meaning	0.78	3.42	0.77	2.96	0.79	2.90	0.83

α = Cronbach's α, N = 20538, religiously affiliated and practicing individuals n = 6165, religiously affiliated and not practicing individuals n = 9138, non-religious individuals n = 5235. SWLS, Satisfaction with Life; OTH, Orientation to Happiness; M, Mean, SD, Standard Deviation.

practiced their religion, scored higher on several character strengths. As expected, religiousness, gratitude, kindness, and forgiveness belonged to the strengths that were mostly pronounced in religious individuals, who indicated that they practice their religion. Other strengths on which these individuals scored higher, were love, hope, and appreciation of beauty. Small effects were also found in association with curiosity, love of learning, persistence, zest, teamwork, leadership, modesty, prudence, and self-regulation. According to these results, engaging in religious practices seems to be beneficial in the development of several strengths. As described earlier, the compilation of the 24 character strengths was based on religious literature to a great extent. Following this, the

results showing that 16 of the 24 strengths were increased in individuals carrying out religious practices are not that surprising. A closer inspection reveals that some of the effects were quite small. However, for four of the 24 strengths, we expected stronger effects, an expectation that was confirmed by our data. These strengths are religiousness, gratitude, kindness, and forgiveness. Our results are in line with previous results that reported positive relations between religiousness and gratitude, as well as forgiveness (Jones, 2006; Lambert et al., 2009).

The present findings also fit well with previous research on religiousness and personality. In the recent past, positive correlations were found, for instance, for *agreeableness*

Table 2 | *F*-values for the comparison of the three groups regarding character strengths, SWLS, and OTH.

	Comparison of individuals with religious affiliation that *practice* (=1) vs. *not practice* (=2) their religion		Comparison of individuals with religious affiliation that *practice* their religion vs. *non-religious* (=3) individuals		Comparison of individuals with religious affiliation that do *not practice* their religion vs. *non-religious* individuals	
	F	η_p^2	*F*	η_p^2	*F*	η_p^2
Creativity	32.47	0.00	2.64	0.00	51.32	0.00
Curiosity[a,b]	204.10	0.01	69.78	0.01	20.44	0.00
Open-mindedness	8.54	0.00	10.76	0.00	38.74	0.00
Love of learning[a,c]	119.14	0.01	0.03	0.00	110.54	0.01
Perspective	28.39	0.00	12.28	0.00	1.68	0.00
Bravery[a]	102.43	0.01	1.28	0.00	70.10	0.00
Persistence[a,b]	124.20	0.01	92.72	0.01	0.02	0.00
Honesty	49.82	0.00	39.59	0.00	0.01	0.00
Zest[a,b]	146.66	0.01	157.75	0.01	3.92	0.00
Love[a,b]	279.07	0.02	308.09	0.03	8.55	0.00
Kindness[a,b]	179.43	0.01	200.21	0.02	6.91	0.00
Social intelligence	39.42	0.00	39.72	0.00	0.66	0.00
Teamwork[a,b]	156.94	0.01	323.37	0.03	59.39	0.00
Fairness[b]	58.67	0.00	100.13	0.01	11.72	0.00
Leadership[a,b]	132.24	0.01	177.24	0.02	12.91	0.00
Forgiveness[a,b]	223.60	0.01	196.42	0.02	1.41	0.00
Modesty[a,b]	79.42	0.01	190.66	0.02	43.02	0.00
Prudence[a,b]	91.14	0.01	77.89	0.01	0.23	0.00
Self-regulation[a,b]	150.07	0.01	93.72	0.01	1.37	0.00
Appreciation of Beauty[a,b]	265.58	0.02	133.89	0.01	8.26	0.00
Gratitude[a,b]	1128.64	0.07	879.29	0.07	0.62	0.00
Hope[a,b]	218.84	0.01	239.93	0.02	6.68	0.00
Humor	0.37	0.00	4.49	0.00	2.93	0.00
Religiousness[a,b]	9815.68	0.39	8413.89	0.42	58.03	0.00
SWLS[a,b]	110.96	0.01	174.90	0.02	18.65	0.00
OTH – pleasure[a,b]	168.21	0.01	130.57	0.01	0.01	0.00
OTH – engagement	61.80	0.00	56.03	0.00	0.43	0.00
OTH – meaning[a,b]	1276.90	0.08	1197.96	0.10	17.96	0.00

N = 20538, SWLS = Satisfaction with Life, OTH = Orientation to Happiness, religious affiliation (1 = yes; 2 = yes, but not practicing, 3 = no), F = F-value, η_p^2 = effect size eta square.

[a] *Substantial differences between religiously affiliated individuals that practice vs. not practice their religion.*
[b] *Substantial differences between religiously affiliated individuals that practice their religion and non-religious individuals.*
[c] *Substantial differences between religiously affiliated individuals that do not practice their religion and non-religious individuals.*

(one of the Big Five traits) and the character strengths *kindness* and *forgiveness* (Macdonald et al., 2008). These correlations are quite reasonable, since agreeableness reflects a general prosocial orientation including qualities such as altruism, kindness, and trust. Also, a meta-analysis showed positive relations between the religiousness-measures and *agreeableness* (Saroglou, 2010). Thus, given that agreeableness is related to the strengths kindness and forgiveness as well as to religiousness measures, it is not surprising that we found an increased

kindness and forgiveness in religious people, who practice their religion.

We know from previous research that the Big Five trait, agreeableness, is also positively related to life satisfaction (DeNeve and Cooper (1998). Thus, one might wonder whether agreeableness could account for the relation between religiousness and satisfaction with life. The findings of Ciarrocchi et al. (2008), however, contradict this conclusion. They found that religious practices, relational faith and other factors of religiousness scales

were significant predictors of hope and optimism above and beyond the Big Five variables.

Another purpose of the present research was to examine the OTH of religiously affiliated individuals that practice vs. those who do not practice their religion – and non-religious individuals. The findings showed that pleasure was lower, whereas meaning was higher in individuals engaging in religious practices compared to those, which did not practice their religion and the non-religious participants. These findings support the findings of previous studies that reported a negative relationship between religiousness and pleasure and a positive relationship between religiousness and meaning (Peterson et al., 2007). Our study extends previous research, because we could show that a religious affiliation alone does not make a difference regarding the life of pleasure and meaning. As predicted, non-religious individuals and those who were religiously affiliated without practicing their religion did not differ from each other. Put differently, only people who practice their religion, seem to have an advantage regarding their feeling for the meaning of life – and thus regarding their happiness.

LIMITATIONS OF THE PRESENT RESEARCH

Our assessment of practicing religion was oversimplified (i.e., yes, no, no religion). Therefore, we do not know exactly what kind of religious practices the respondents undertook in their lives. Some might have thought of church attendance, others might have considered that personal prayer or the reading of religious literature is a way of practicing one's religion. Since we do not know what specific religious practices our participants carried out, it is not possible to analyze, whether or not there were differences regarding religious practices in terms of satisfaction with life. Some religious practices might be more important than others with respect to peoples' life satisfaction or their character strengths. Hence, future research should use a more refined assessment of the various religious practices.

Another limitation of our study is that it is impossible to infer the direction of causality of the effects. All variables were assessed only once and the study did not include any manipulation of the independent variables. However, since other studies using a longitudinal design have already shown that religiousness has a causal influence on life satisfaction (Headey et al., 2010), we assume that practicing religion has a causal effect on life satisfaction and the character strengths as well. Future studies addressing these phenomena are clearly warranted.

CONCLUSION AND PRACTICAL IMPLICATIONS OF THE PRESENT RESEARCH

The results of the present study indicate that practicing (as opposed to merely passively "belonging to" a) religion does indeed make a difference regarding an individuals' degree of satisfaction with life, their character strengths and their evaluation of the meaning in life. Drawing the distinction between people who actively practice their religion vs. those who consider themselves to be part of a religion but do not actively practice it enabled us to examine the importance of practicing one's religion. The findings of the present research provide evidence for the widely shared assumption that the cultivation of one's strengths is beneficial. Aside to being more satisfied with one's life, it is possible

that some of the other corresponding character strengths might be fostered as well.

Up to the present time, we do not know if it is possible that practicing a particular strength can backfire under some specific circumstances. Even though the present findings clearly indicate a positive influence of practicing religion on life satisfaction, adverse effects might also be possible. Imagine someone who, for example, is forcing herself/himself to attend church every week, although that exercise does not really mean anything to her/him. The common expectation would, of course, be that the person would cease that behavior. The possibility, nonetheless, exists that some people might cultivate behaviors corresponding to character strengths that do not match their personal characters and thus, might decrease their feelings of well-being. Testing this hypothesis remains a challenge for future research.

Finally, it is important to note that our respondents were from countries (i.e., Germany, Switzerland, and Austria) that are characterized by a declining development regarding the organized religions. Thus, it would be interesting to conduct another study after a certain period of time. If the declining development continues, the percentage of people who do not actively practice their religion should diminish. As they do not benefit from being religiously affiliated, they are least likely to continue.

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Character strengths and well-being across the life span: data from a representative sample of German-speaking adults living in Switzerland

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Character strengths are positive, morally valued traits of personality. This study aims at assessing the relationship between character strengths and subjective well-being (i.e., life satisfaction, positive and negative affect) in a representative sample of German-speaking adults living in Switzerland ($N = 945$). We further test whether this relationship is consistent at different stages in life. Results showed that hope, zest, love, social intelligence and perseverance yielded the highest positive correlations with life satisfaction. Hope, zest, humor, gratitude and love presented the highest positive correlations with positive affect. Hope, humor, zest, honesty, and open-mindedness had the highest negative correlations with negative affect. When examining the relationship between strengths and well-being across age groups, in general, hope, zest and humor consistently yielded the highest correlations with well-being. Additionally, in the 27–36 years group, strengths that promote commitment and affiliation (i.e., kindness and honesty) were among the first five positions in the ranking of the relationship between strengths and well-being. In the 37–46 years group, in addition to hope, zest and humor, strengths that promote the maintenance of areas such as family and work (i.e., love, leadership) were among the first five positions in the ranking. Finally, in the 47–57 years group, in addition to hope, zest and humor, strengths that facilitate integration and a vital involvement with the environment (i.e., gratitude, love of learning) were among the first five positions in the ranking. This study partially supports previous findings with less representative samples on the association between character strengths and well-being, and sheds light on the relative importance of some strengths over others for well-being across the life span.

Keywords: character strengths, virtues, positive psychology, VIA-IS, character strengths rating form (CSRF), well-being, representative sample

INTRODUCTION

Good character can be understood as a family of morally valued, positive traits of personality, which are relatively stable and generalizable across different situations, but which are not necessarily fixed or rooted in immutable genetic features (Peterson and Seligman, 2004). Although character has been a matter of reflection since ancient times, it has been neglected in psychology until very recently. This state of abandonment was probably due to the influence of Allport (1921), one of the most prominent figures of personality, who argued that character was not part of psychology, but it belonged to the social ethics field. However, with the emergence in the late 90s of positive psychology, the study of character regained attention in psychology and was established as a legitimate research topic.

Based on an extensive review of religious and philosophical texts, Peterson and Seligman (2004) proposed a classification of character strengths and virtues. The authors suggested the existence of six virtues, namely, wisdom, courage, humanity, justice, temperance, and transcendence. Virtues are the core characteristics of character valued by religious thinkers and philosophers. The virtue of wisdom comprises cognitive strengths that entail the acquisition and use of knowledge. The virtue of courage contains emotional strengths that involve the exercise of will to accomplish goals in the face of opposition, external or internal. The virtue of humanity includes interpersonal strengths that involve "tending and befriending" others. The virtue of justice comprises civic strengths that underlie healthy community life. The virtue of temperance contains strengths that protect against excess. And finally, the virtue of transcendence includes strengths that forge connections to the larger universe and provide meaning (Ruch et al., 2014). Moreover, each virtue comprises a number of strengths, up to a total of 24 strengths, which are the psychological ingredients that define the virtues. For example, the virtue of wisdom includes strengths such as curiosity or creativity, while the virtue of transcendence includes strengths such as hope or humor.

Empirical evidence shows that the endorsement of character strengths is significantly related to a higher degree of well-being. Usually strengths are positively correlated with life satisfaction, especially hope, zest, gratitude, curiosity and love (e.g., Park et al., 2004; Ruch et al., 2010, 2013; Buschor et al., 2013). However, some studies have shown slightly different results. For example, in a Swiss sample, Peterson et al. (2007) found that the strengths most highly correlated positively with life satisfaction were hope, zest, perseverance, and love, with social intelligence, perspective and curiosity occupying the fifth position. Also Ruch et al. (2007) found that hope, zest, love, curiosity, and perseverance were the five strengths with the highest positive correlations with life satisfaction in another Swiss sample. Lowest correlations, usually non-significant, are found for strengths such as modesty, prudence, fairness or religiousness/spirituality (e.g., Ruch et al., 2010). Other studies have shown a positive correlation with positive affect (e.g., Güsewell and Ruch, 2012; Littman-Ovadia and Lavy, 2012; Azañedo et al., 2014). Littman-Ovadia and Lavy (2012) found that the five strengths most highly correlated positively with positive affect were zest, curiosity, love of learning, hope and perspective, while the lowest correlations were observed for religiousness/spirituality (non-significant), forgiveness, modesty, prudence, and appreciation of beauty and excellence. Azañedo et al. (2014) found that zest, hope, curiosity, creativity, and perspective most highly and positively correlated with positive affect, while the lowest correlations were observed for modesty (non-significant), prudence, fairness, religiousness/spirituality, and forgiveness. For negative affect, Littman-Ovadia and Lavy (2012) found that the five strengths with the highest negative correlations were hope, curiosity, zest, love and self-regulation, while the lowest negative correlations were observed for appreciation of beauty and excellence, modesty, creativity, bravery, and prudence (all non-significant). Azañedo et al. (2014) found that the five strengths with the highest negative correlations with negative affect were hope, zest, self-regulation, persistence, gratitude, and forgiveness, while the lowest negative correlations were observed for creativity (non-significant), appreciation of beauty and excellence (non-significant), religiousness/spirituality (non-significant), modesty, and love of learning and leadership. In general, correlations were larger in size with positive affect than with negative affect in both studies. However, one limitation most studies in character strengths research share is the limited representativeness of their samples. Usually in these studies, participants are students who participate to obtain extra credits in their courses, individuals who are actively seeking how to increase their well-being, or simply convenience samples that normally result in biased samples. Therefore, we believe that studies with more representative samples are necessary in character research.

Additionally, the relationship between character strengths and well-being might be different for individuals at different stages of life, a question that still remains largely unexplored. Based on Erikson's account of stages of psychosocial development, we believe that strengths may help the individuals adapt successfully to the different stages of life, and their relative importance might be reflected in their relationship with well-being. Erikson (1982) described eight stages in psychosocial development, three of which correspond to the adult life: young adulthood, adulthood, and old age. Regarding the age range proper to these stages, according to Erikson, they are delimited by the earliest moment a developmental quality can come to relative dominance and to a meaningful crisis, and the latest at which it must yield that dominance to the next quality, although no specific ages are indicated. Young adults experience the psychosocial crisis between intimacy and isolation. Intimacy refers to the capacity to commit oneself to concrete affiliations that may call for sacrifices and compromises, while isolation is the fear of remaining separate. Intimacy must provide ways that cultivate styles of in-group living held together by idiosyncratic ways of behaving and speaking. The next stage, adulthood, is characterized by the psychosocial crisis between generativity and stagnation. According to Erikson, the spirit of adulthood is the maintenance of the world, i.e., the commitment to take care of the persons, the products, and the ideas one has learned to take care for. Finally, in old age, the psychosocial crisis is characterized by the antithesis between a sense of integrity, i.e., coherence and wholeness, vs. a sense of despair, i.e., a state of being finished, confused and helpless. Integrity seems to convey wisdom, defined by Erikson as a type of informed and detached concern with life itself in the face of death itself. For Erikson, hope is the "most basic quality of I-ness, without which life could not begin or meaningfully end." In fact, if hope is for him the first strength emerging in infancy, faith is the mature and last possible form of hope. Also, according to Erikson, all functions specific of a life stage do not disappear in the next stage, but assume new values. In fact, old people need to keep a generativity function. However, in old age, a discontinuity of the family life contributes to the lack of the vital involvement that is necessary for staying really alive. In fact, lack of vital involvement is often the hidden reason that brings old people to psychotherapy (Erikson, 1982). Considering Erikson's theory, strengths that help fulfill the specific functions of each stage of life, should have a larger relationship with well-being in that stage in comparison with other strengths.

Nonetheless, empirical evidence on this topic is almost non-existent. As far as we know, only one study has explored the relationship between character strengths and well-being (specifically, life satisfaction) across different age groups. Isaacowitz et al. (2003) suggested that strengths that help individuals explore the world and protect them from difficulties should be more strongly related to well-being for young adults. Strengths related to building a career and a family should be more strongly associated with well-being for middle-aged individuals. Finally, strengths that contribute to keep social relationships should be more strongly related to well-being in older individuals. Also, since older individuals regulate their emotions better than younger individuals, Isaacowitz et al. (2003) also suggested that strengths related to temperance and control should be more important for the well-being of older individuals. Additionally, since older adults do not have to invest so much time and effort in raising a family and building a career, they might have more opportunities to apply their strengths and thus strengths would be more strongly related to well-being. Using a narrower classification of strengths than the classification proposed by Peterson and Seligman (2004), Isaacowitz et al. (2003) observed that for young adults, only hope significantly predicted life satisfaction. For middle-aged

individuals, only the capacity for loving relationships predicted life satisfaction. For community older adults, only the strengths of hope, citizenship, and loving relationships predicted life satisfaction. Although we embrace the empirical evidence that this study provides, unfortunately Isaacowitz et al. (2003) used a classification of strengths different from Peterson and Seligman's (2004) classification, and the samples used were not representative of the population.

In order to fulfill the need of studies that test the relationship between character strengths and well-being in more representative samples, and, considering the virtual non-existence of studies assessing this relationship across the life span, the aim of this study is twofold. First, we examined the relationship between character strengths and subjective well-being (i.e., life satisfaction, positive affect, and negative affect) in a representative sample of German-speaking adults living in Switzerland. Using a more representative sample will provide a more accurate account of the relationship between character strengths and well-being. In general, we expect strengths to correlate positively with life satisfaction and positive affect, and negatively with negative affect. Moreover, based on previous studies (e.g., Park et al., 2004; Peterson et al., 2007; Ruch et al., 2010), we predict that, in general, strengths such as hope, zest, love, curiosity, gratitude, perseverance, social intelligence and perspective might yield the highest positive correlations with life satisfaction, while strengths such as modesty, prudence, fairness or spirituality/religiousness might show the lowest positive correlations. Also based on previous evidence (i.e., Littman-Ovadia and Lavy, 2012; Azañedo et al., 2014), positive affect might be more highly and positively correlated with zest, curiosity, hope, love of learning, creativity, and perspective, while lowest positive correlations are expected with modesty, prudence, fairness, spirituality/religiousness, forgiveness, and appreciation of beauty and excellence. On the other hand, negative affect might yield the highest negative correlations with hope, zest, curiosity, self-regulation, love, persistence, gratitude, and forgiveness, while the lowest negative correlations are expected with creativity, appreciation of beauty and excellence, spirituality/religiousness, modesty, love of learning, leadership, bravery, and prudence. Similarly, according to prior data (i.e., Littman-Ovadia and Lavy, 2012; Azañedo et al., 2014), it is possible that the relationship with the positive indicators of well-being (i.e., life satisfaction and positive affect) is, overall, larger in size than with the negative indicator (i.e., negative affect).

The second goal of this study is to examine the relationship between strengths and subjective well-being (i.e., life satisfaction, positive affect and negative affect) across the life span. Differences in the relationship between strengths and well-being across the life span can have important implications not only for character strengths theory, but also for strengths-based interventions. Depending on the age of the clients, these interventions might be helpful in the attempt to focus especially on the strengths most highly associated with well-being in the corresponding life stage, in order to improve the person-fit and increase their efficacy. Building upon Isaacowitz et al.'s (2003) study and Erikson's theory of the stages of psychosocial development, we believe that hope might be especially relevant at all stages, although it may take another form in old age, i.e., faith. Although strengths that

help forge social connections should be important at all stages, we believe that especially for young adults, strengths that promote the commitment and affiliation with others, such as honesty, kindness, social intelligence, teamwork, gratitude, humor or love, might yield larger correlations with well-being in comparison to other strengths. For adults, we think that strengths that support the maintenance of the world (i.e., take care of people, products, and ideas), such as perseverance, love or leadership, might present larger correlations with well-being in comparison to other strengths. And finally, for old adults, who have lived most of their life and have a greater awareness of finitude, strengths that enable individuals to integrate the past into the present, such as gratitude and forgiveness, and allow them to transcend themselves in order to feel part of a broader reality, strengths such as spirituality/religiousness, might be particularly advantageous. Also, strengths that enable one to keep an active lifestyle, such as zest, love of learning, or curiosity, and a positive outlook of life, such as gratitude, hope, or humor, might be particularly beneficial for old adults. Additionally, according to Isaacowitz et al. (2003), since old adults might be more free than young adults from the need to build resources for the future, and fulfill professional and family responsibilities, it is possible that old adults can actually apply more of their strengths in their lives, and thus, strengths in general might yield higher correlations with well-being in the old adults. According to Erikson's theory, the functions typical of each life stage do not disappear in the next stage but change their values. Therefore, in old age there might be more functions to fulfill and more character strengths may be helpful in fulfilling these functions. Thus, strengths might yield a higher positive correlation with well-being in old adults than in younger individuals.

MATERIALS AND METHODS
PARTICIPANTS
A representative sample of 945 German-speaking adults of working age (459 men, 486 women) living in Switzerland participated in this study. The age of participants ranged from 27 to 57 years ($M = 43.60$, $SD = 8.62$). Most participants were Swiss ($n = 792$), 152 had other nationalities different from Swiss, and one person did not report the nationality. Most participants were married or in a relationship ($n = 536$), 261 were single, 87 were divorced, 22 were separated, nine were widowed, and 30 reported to be in an "other" situation. Regarding the educational level, 309 participants had completed tertiary education (e.g., university), 487 had finished secondary education (e.g., vocational training or high school), 33 had finished primary school, one had not finished primary school, 52 reported an "other" education level, and 63 were missing values. Concerning religion, 296 belonged to the Protestant church/Evangelical reformed, 18 to other Evangelical communities and Free churches, 297 to the Roman Catholic church, eight to the Christian Catholic church, 17 to the Orthodox Christian church, eight to other Christian communities, 18 to Islamic communities, 12 to other churches and religious communities, 208 did not have any religious affiliation, and 63 did not list their religious community/preferences. Three age subgroups were created. The first group ($n = 241$) comprised participants with ages ranging from 27 to 36, including participants with 27 and 36 years old. The second group

($n = 301$) consisted of participants with ages ranging from 37 to 46, including participants with 37 and 46 years old. Finally, the third group ($n = 403$) comprised participants with ages ranging from 47 to 57, including participants with 47 and 57 years old.

INSTRUMENTS

The *Character Strengths Rating Form* (*CSRF*; Ruch et al., 2014) is a 24-item rating form of character strengths, based on the classification proposed by Peterson and Seligman (2004). It uses a 9-point Likert scale (1, totally inaccurate; 2, inaccurate; 3, largely inaccurate; 4, partially inaccurate; 5, neither one nor the other; 6, partially accurate; 7, largely accurate; 8, accurate; 9, completely accurate). Each item is a description of a strength and measures the endorsement of that specific strength. For example, the item measuring creativity is: "Creativity (originality, ingenuity): Creative people have a highly developed thinking about novel and productive ways to solve problems and often have creative and original ideas. They do not content themselves with conventional solutions if there are better solutions." The German version was used. The CSRF has shown good convergence with the Values in Action Inventory of Strengths (VIA-IS, Peterson and Seligman, 2004), in terms of descriptive statistics, relationships with socio-demographic variables and life satisfaction, and factor structure (Ruch et al., 2014). The development of the CSRF was motivated by the need to include a short measure of character strengths in a large-scale longitudinal study, i.e., the NCCR-LIVES project (*Swiss National Centre of Competence in Research LIVES—Overcoming vulnerability: Life course perspectives*), which studies the impact of vulnerabilities and strengths on life over time.

The *Satisfaction with Life Scale* (*SWLS*; Diener et al., 1985) is a 5-item questionnaire for the subjective assessment of global life satisfaction (e.g., "I am satisfied with my life"), utilizing a 7-point answer format (1, strongly disagree; 2, disagree; 3, slightly disagree; 4, neither disagree nor agree; 5, slightly agree; 6, agree; 7, strongly agree). We used the German version used by Ruch et al. (2010), which was developed in a standardized translation-back-translation-procedure, and has shown good psychometric properties. Cronbach alpha in the present study was 0.91.

The *Affect Scale* of the *Midlife Development Inventory* (*MIDI-Affect*; Mroczek and Kolarz, 1998) is a 12-item questionnaire for the assessment of positive affect (6 items, e.g., "During the last month, how much of the time did you feel cheerful?") and negative affect (6 items, e.g., "During the last month, how much of the time did you feel hopeless?"). A 5-point answer format is used (1, none of the time; 2, rarely; 3, from time to time; 4, most of the time; 5, all of the time). Positive and negative affect scales have shown internal consistencies of $\alpha = 0.91$ and $\alpha = 0.87$ respectively (Mroczek and Kolarz, 1998). A German version of the scale was used, which was translated following a standardized translation-back-translation-procedure, which is described below. Cronbach alphas in the present study were 0.85 for positive affect and 0.82 for negative affect.

PROCEDURE

We present data from a project focused on the impact of individual characteristics, resources and cultural background on professional trajectories; this project is part of the NCCR-LIVES (*Swiss National Centre of Competence in Research LIVES—Overcoming vulnerability: Life course perspectives*). In this ongoing longitudinal project, data are collected over seven consecutive years from a representative sample of individuals living in Switzerland (Maggiori et al., in press). We present some data from the second wave of data collection, carried out in 2013. The recruitment was done on the base of a representative sample of subjects with ages ranging between 26 and 56 years drawn from the Swiss national register of inhabitants and conducted by the Swiss Federal Statistics Office. An institute specialized in research surveys conducted the data collection. First, participants received a letter with the study description. Then, the first part of the survey (sociodemographic data and employment-related information) was performed either by phone or online (participants could choose the method), and the second part (remaining questionnaires) was conducted either using a paper and pencil method, or online. Participants answered the survey at home or at any place they wished. The time of survey completion was approximately 40 to 55 min, but participants did not have any limit in this regard. When necessary, the instruments used in the survey were translated from the original language into German. Two independent translations in German were done by bilingual psychologists, and combined into one. This translation was then checked and back-translated into English. The comparison of the two versions was done by the original author/translator. Finally, the research survey institute in charge of the data collection checked the final versions. This study fulfills the ethical standards for research of the Swiss Society for Psychology. Participants' anonymity was preserved. The institute specialized in research surveys which conducted the data collection kept the personal information and researchers received only a dataset in which participants were assigned numerical codes, and no personal information. Also, once the research project is finished, all personal information will be destroyed (expected to be completed in 2018). Participants are free to withdraw from the study at any time. Participants received a gift for a value of 20 Swiss francs for their participation.

RESULTS

DESCRIPTIVE STATISTICS

Table 1 shows the means and standard deviations of the 24 strengths and the well-being indicators in the total sample, and across age categories.

We carried out a series of one-way analyses of variance to explore differences in character strengths and well-being between different age groups. Age groups significantly differed in love $F_{(2, 942)} = 4.73$, $p = 0.009$, kindness, $F_{(2, 942)} = 3.15$, $p = 0.043$, humor, $F_{(2, 942)} = 4.31$, $p = 0.014$, and spirituality/religiousness, $F_{(2, 942)} = 3.12$, $p = 0.044$. Post hoc comparisons with Bonferroni correction showed that the 27–36 years group scored significantly higher in kindness ($p = 0.064$, $d = 0.20$) and humor ($p = 0.010$, $d = 0.15$) than the 47–57 years group. On the other hand, the 47–57 years group scored significantly higher than the 27–36 years group in love ($p = 0.008$, $d = 0.05$) and religiousness ($p = 0.078$, $d = 0.18$). Regarding differences in well-being, age groups did not differ significantly.

CORRELATIONS BETWEEN STRENGTHS AND WELL-BEING

The correlations between strengths and well-being in the total sample are presented in **Table 2**. This table also shows the rank order of these correlations for each indicator of well-being, and the mean absolute values of these correlations across strengths and across indicators.

Additionally, we examined whether these correlations varied across age groups (see **Table 3** for participants with ages between 27 and 36 years, **Table 4** for participants with ages between 37 and 46 years, and **Table 5** for participants with ages between 47 and 57 years).

To compare the rank order of the relationships between character strengths and either life satisfaction, positive affect or negative affect across age groups, we calculated a series of Spearman correlations. In life satisfaction, when comparing the rank order of the 27–36 years group and the 37–46 years, the Spearman correlation was 0.77. When comparing the 27–36 years group and the 47–57 years group, the Spearman correlation was 0.64. And finally, when comparing the 37–46 years group and the 47–57

years group, the Spearman correlation was 0.66. In positive affect, when comparing the 27–36 years group and the 37–46 years group, the Spearman correlation was 0.56. When comparing the 27–36 years group and the 47–57 years, the Spearman correlation was 0.50. Finally, when comparing the 37–46 years group and the 47–57 years group, the Spearman correlation was 0.56. In negative affect, when comparing the 27–36 years group and the 37–46 years group, the Spearman correlation was 0.62. When comparing the 27–36 years group and the 47–57 years group, the Spearman correlation was 0.46. And finally, when comparing the 37–46 years group and the 47–57 years group, the Spearman correlation was 0.47.

Additionally, in order to test whether the size of the correlations between strengths and well-being were statistically different among the three age groups, we conducted a series of Z test. In order to control for the number of comparisons performed, here we only report the comparisons that were significantly different at $p < 0.01$. The remaining Z tests are available in the **Table 6**, in the supplementary material of this article. The correlation between

Table 1 | Means and standard deviations of strengths and well-being indicators in the total sample, and across age groups.

	Total		Age 27–36		Age 37–46		Age 47–57	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
STRENGTHS								
Creativity	6.39	1.86	6.32	1.86	6.29	1.89	6.51	1.84
Curiosity	6.90	1.61	6.89	1.53	6.83	1.64	6.97	1.64
Open-mindedness	6.79	1.53	6.76	1.47	6.70	1.62	6.88	1.49
Love Learning	6.69	1.61	6.66	1.60	6.70	1.54	6.69	1.67
Perspective	6.54	1.56	6.59	1.49	6.53	1.53	6.52	1.62
Bravery	6.27	1.69	6.26	1.70	6.22	1.70	6.32	1.68
Perseverance	6.79	1.56	6.71	1.54	6.76	1.65	6.87	1.49
Honesty	7.41	1.40	7.40	1.44	7.41	1.44	7.43	1.34
Zest	6.33	1.61	6.37	1.60	6.32	1.63	6.31	1.61
Love	6.96	1.54	7.01	1.53	6.74	1.60	7.09	1.49
Kindness	7.21	1.35	7.40	1.31	7.14	1.40	7.14	1.34
Social intelligence	7.08	1.42	7.19	1.41	6.98	1.48	7.08	1.38
Teamwork	6.81	1.55	6.90	1.53	6.84	1.51	6.72	1.60
Fairness	7.20	1.37	7.15	1.39	7.21	1.38	7.22	1.35
Leadership	6.49	1.72	6.48	1.64	6.46	1.82	6.53	1.68
Forgiveness	6.72	1.54	6.69	1.47	6.68	1.62	6.77	1.53
Modesty	6.24	1.76	6.19	1.73	6.30	1.69	6.22	1.84
Prudence	6.25	1.68	6.13	1.73	6.37	1.65	6.23	1.68
Self-regulation	5.85	1.77	5.81	1.86	5.90	1.73	5.84	1.74
Appreciation Beauty	6.56	1.61	6.46	1.60	6.49	1.60	6.67	1.61
Gratitude	6.78	1.46	6.85	1.47	6.80	1.45	6.71	1.47
Hope	6.86	1.50	6.97	1.41	6.82	1.53	6.83	1.52
Humor	6.86	1.60	7.09	1.44	6.87	1.57	6.71	1.69
Spirituality/ Religiousness	5.03	2.41	4.82	2.36	4.90	2.43	5.25	2.40
WELL-BEING								
Life satisfaction	5.19	1.17	5.19	1.17	5.18	1.22	5.20	1.12
Positive affect	3.63	0.56	3.61	0.55	3.62	0.56	3.64	0.58
Negative affect	1.92	0.59	1.98	0.59	1.94	0.61	1.87	0.58

Table 2 | Correlations between strengths and different indicators of well-being, rank order, and mean absolute values of these correlations across strengths (columns) and well-being indicators (rows).

Strengths	*SWL*	*R*	*PA*	*R*	*NA*	*R*	*M*	*R*
Creativity	0.13*	14	0.15*	13	−0.09*	16	0.12	14
Curiosity	0.15*	8	0.17*	10	−0.11*	8	0.14	8
Open-mindedness	0.11*	16	0.11*	20	−0.13*	5	0.12	16
Love Learning	0.17*	6	0.15*	14	−0.11*	10	0.14	11
Perspective	0.15*	9	0.14*	18	−0.07	19	0.12	15
Bravery	0.10*	18	0.14*	16	−0.10*	13	0.11	18
Perseverance	0.19*	5	0.20*	6	−0.12*	6	0.17	5
Honesty	0.14*	12	0.14*	17	−0.14*	4	0.14	10
Zest	0.26*	2	0.32*	2	−0.16*	3	0.25	2
Love	0.23*	3	0.20*	5	−0.10*	12	0.18	4
Kindness	0.15*	10	0.18*	8	−0.07	17	0.13	12
Social intelligence	0.20*	4	0.17*	9	−0.12*	7	0.16	6
Teamwork	0.12*	15	0.17*	11	−0.10*	11	0.13	13
Fairness	0.05	21	0.10*	19	−0.06	20	0.07	20
Leadership	0.14*	11	0.18*	7	−0.11**	9	0.14	9
Forgiveness	0.08	19	0.16*	12	−0.07	18	0.10	19
Modesty	−0.03	24	0.03	24	0.01	23	0.02	24
Prudence	0.06	20	0.08	22	−0.04	21	0.06	21
Self-regulation	0.11*	17	0.15*	15	−0.09*	15	0.11	17
Appreciation Beauty	0.05	22	0.10*	21	−0.01	22	0.05	22
Gratitude	0.16*	7	0.22*	4	−0.09*	14	0.16	7
Hope	0.31*	1	0.35*	1	−0.25*	1	0.30	1
Humor	0.14*	13	0.27*	3	−0.17*	2	0.19	3
Spirituality/ Religiousness	0.03	23	0.03	23	0.04	24	0.03	23
M/R	0.14	2	0.16	1	0.10	4	0.13	

N = 945. SWL, satisfaction with life; PA, positive affect; NA, negative affect; M, mean absolute value; R, rank order.

*p < 0.01. **p < 0.001.

Table 3 | Correlations between strengths and well-being in the 27–36 years group (n = 241).

Strengths	SWL	R	PA	R	NA	R	M	R
Creativity	0.10	17	0.04	18	−0.00	18	0.05	20
Curiosity	0.14	10	0.15	8	−0.01	17	0.10	13
Open-mindedness	0.12	13	0.09	14	−0.05	12	0.09	15
Love Learning	0.13	12	0.08	15	−0.06	9	0.09	14
Perspective	0.12	14	0.05	17	0.02	20	0.06	18
Bravery	0.01	22	0.03	20	−0.00	19	0.01	24
Perseverance	0.16	9	0.13	10	−0.09	7	0.12	10
Honesty	0.16	8	0.16	7	−0.16	2	0.16	5
Zest	0.28*	2	0.24*	3	−0.09	6	0.21	2
Love	0.23*	5	0.13	9	−0.02	15	0.13	9
Kindness	0.25*	3	0.19*	4	−0.06	11	0.17	4
Social intelligence	0.25*	4	0.11	11	−0.10	5	0.15	6
Teamwork	0.10	16	0.18*	5	−0.13	4	0.14	7
Fairness	0.06	20	0.09	13	−0.06	10	0.07	16
Leadership	0.14	11	0.10	12	−0.07	8	0.10	12
Forgiveness	0.02	21	−0.01	22	0.03	22	0.02	23
Modesty	0.00	23	−0.09	23	0.02	21	0.04	22
Prudence	0.11	15	0.04	19	−0.05	13	0.07	17
Self-regulation	0.08	18	0.05	16	−0.02	16	0.05	19
Appreciation Beauty	0.07	19	−0.00	21	0.04	23	0.04	21
Gratitude	0.16	6	0.16	6	−0.03	14	0.12	11
Hope	0.31*	1	0.26*	1	−0.31*	1	0.29	1
Humor	0.16	7	0.25*	2	−0.14	3	0.18	3
Spirituality/Religiousness	−0.06	24	−0.20*	24	0.15	24	0.13	8
M/R	0.13	1	0.12	2	0.07	4	0.11	

SWL, satisfaction with life; PA, positive affect; NA, negative affect; M, mean absolute value; R, rank order.
*p < 0.01.

Table 4 | Correlations between strengths and well-being in the 37–46 years group (n = 301).

Strengths	SWL	R	PA	R	NA	R	M	R
Creativity	0.14	9	0.11	17	−0.08	17	0.12	13
Curiosity	0.20*	5	0.16*	11	−0.17*	7	0.18	7
Open-mindedness	0.09	13	0.07	22	−0.21*	4	0.12	12
Love Learning	0.16*	7	0.09	20	−0.12	13	0.12	11
Perspective	0.14	11	0.14	13	−0.10	15	0.13	10
Bravery	0.07	17	0.15	12	−0.10	14	0.11	17
Perseverance	0.22*	3	0.24*	4	−0.14	10	0.20	6
Honesty	0.08	14	0.10	19	−0.14	11	0.11	18
Zest	0.22*	4	0.32*	2	−0.17*	5	0.24	2
Love	0.27*	2	0.24*	5	−0.15*	8	0.22	3
Kindness	0.08	16	0.13	14	−0.10	16	0.10	19
Social intelligence	0.18*	6	0.16	10	−0.15*	9	0.16	8
Teamwork	0.07	18	0.10	18	−0.09	19	0.09	20
Fairness	0.08	15	0.11	16	−0.13	12	0.11	16
Leadership	0.16*	8	0.23*	6	−0.21*	3	0.20	5
Forgiveness	0.05	21	0.21*	8	−0.09	18	0.12	14
Modesty	−0.04	24	0.08	21	−0.03	22	0.05	22
Prudence	0.05	20	0.13	15	−0.09	20	0.09	21
Self-regulation	0.07	19	0.21*	7	−0.17*	6	0.15	9
Appreciation Beauty	−0.03	23	0.03	24	0.03	24	0.03	23
Gratitude	0.09	12	0.16*	9	−0.08	21	0.11	15
Hope	0.30*	1	0.39*	1	−0.30*	1	0.33	1
Humor	0.14	10	0.28*	3	−0.23*	2	0.22	4
Spirituality/Religiousness	−0.00	22	0.07	23	−0.02	23	0.03	24
M/R	0.12	4	0.16	1	0.13	3	0.14	

SWL, satisfaction with life; PA, positive affect; NA, negative affect; M, mean absolute value; R, rank order.
*p < 0.01.

positive affect and creativity was significantly larger in the 47–57 years group than in the 27–36 years group ($Z = 2.49$, $p = 0.006$). Also, the correlation between positive affect and forgiveness was significantly larger in the 37–46 years group ($Z = 2.50$, $p = 0.006$) and in the 47–57 years group ($Z = 2.87$, $p = 0.002$) than in the 27–36 years group. Likewise, the correlation between positive affect and religiousness was significantly different in the 27–36 years group than the correlation in the 37–46 years group ($Z = 3.06$, $p = 0.001$) and in the 47–57 years group ($Z = 4.05$, $p < 0.001$). The remaining comparisons were not significantly different at $p < 0.01$.

DISCUSSION

This study offers novel evidence of the relationship between character strengths and subjective well-being in a representative sample of German-speaking adults living in Switzerland, as well as of this relationship across three different age groups.

The first goal of the study was to test whether the relationship between character strengths and subjective well-being observed in previous studies held in a more representative sample. The first five strengths most highly correlated, positively and significantly, with life satisfaction in the sample used in this study

were hope, zest, love, social intelligence, and perseverance; this is highly consistent with previous findings in studies using Swiss samples and with our assumptions (e.g., Peterson et al., 2007; Ruch et al., 2007). This result is also relatively consistent with previous findings conducted with samples from other countries, where hope, zest, gratitude, curiosity and love usually yield the highest positive, significant correlations with life satisfaction (e.g., Park et al., 2004). In our sample, gratitude and curiosity held the 7th and 8th positions, respectively, i.e., relatively high positions in this ranking. Moreover, curiosity was among the five first strengths in this ranking in the 37–46 years group, and gratitude in the 47–57 years group. Although the profile observed in our study could seem as representative of the Swiss profile, as it converges very well with previous studies conducted with Swiss samples, other studies with Swiss samples have found results similar to the ones reported in most of the studies conducted on the relationship between character strengths and life satisfaction. For example, Buschor et al. (2013) found that hope, zest, love, curiosity, and gratitude were the five strengths with the highest positive correlations with life satisfaction. Nonetheless, it is worth noting that, in this same study, peer-ratings of the relationship between character strengths and life satisfaction showed

Table 5 | Correlations between strengths and well-being in the 47–57 years group (n = 403).

Strengths	SWL	R	PA	R	NA	R	M	R
Creativity	0.15*	13	0.24*	5	−0.12	8	0.17	9
Curiosity	0.12	19	0.18*	17	−0.12	10	0.14	16
Open-mindedness	0.13	17	0.14*	20	−0.11	11	0.13	18
Love Learning	0.20*	5	0.23*	6	−0.12	7	0.18	5
Perspective	0.18*	7	0.19*	14	−0.11	12	0.16	12
Bravery	0.17*	10	0.21*	9	−0.15*	4	0.17	6
Perseverance	0.20*	6	0.20*	13	−0.12	9	0.17	7
Honesty	0.18*	8	0.17*	18	−0.14*	6	0.16	11
Zest	0.29*	2	0.36*	2	−0.18*	2	0.28	2
Love	0.21*	4	0.21*	10	−0.10	16	0.17	8
Kindness	0.15*	14	0.21*	11	−0.07	18	0.14	15
Social intelligence	0.17*	9	0.21*	8	−0.11	13	0.17	10
Teamwork	0.17*	11	0.21*	12	−0.10	15	0.16	13
Fairness	0.01	23	0.11*	22	−0.00	22	0.04	22
Leadership	0.13	16	0.18*	16	−0.04	20	0.12	20
Forgiveness	0.14*	15	0.22*	7	−0.10	14	0.15	14
Modesty	−0.04	24	0.05	24	0.02	23	0.04	23
Prudence	0.03	22	0.06	23	−0.00	21	0.03	24
Self-regulation	0.16*	12	0.17*	19	−0.07	17	0.13	17
Appreciation Beauty	0.10	20	0.19*	15	−0.07	19	0.12	19
Gratitude	0.23*	3	0.29*	3	−0.15*	5	0.22	3
Hope	0.32*	1	0.36*	1	−0.19*	1	0.29	1
Humor	0.13	18	0.28*	4	−0.15*	3	0.18	4
Spirituality/ Religiousness	0.11	21	0.13*	21	0.03	24	0.09	21
M/R	0.15	2	0.20	1	0.10	5	0.15	

SWL, satisfaction with life; PA, positive affect; NA, negative affect; M, mean absolute value; R, rank order.

*p < 0.01.

that hope, zest, curiosity, perseverance, and humor were the five strengths with the highest positive correlations with life satisfaction. Thus, perseverance appears again as one the strengths most highly correlated positively with life satisfaction in a Swiss sample. When considering the lowest correlations with life satisfaction, modesty, religiousness, appreciation of beauty and excellence, fairness, and prudence showed the lowest correlations, all non-significant, which is highly consistent with previous findings and with our expectations (e.g., Park et al., 2004; Ruch et al., 2007, 2010).

In relation to positive affect, hope, zest, humor, gratitude and love were the strengths most highly correlated, positively and significantly, with positive affect, what is only partially consistent with previous research and with our assumptions (e.g., Littman-Ovadia and Lavy, 2012; Azañedo et al., 2014). Azañedo et al. (2014) and Littman-Ovadia and Lavy (2012), found that, besides hope and zest, strengths related to the use and acquisition of knowledge, such as curiosity, creativity, perspective or love of learning, yielded the highest positive correlations with positive affect. The lowest correlations with positive affect were for modesty (non-significant), religiousness (non-significant), appreciation of beauty and excellence (non-significant), prudence

(significant) and open-mindedness (significant), which is highly consistent with previous findings and with our hypotheses (Littman-Ovadia and Lavy, 2012). On the other hand, in our study, aside from hope and zest, which are common to the other studies just discussed, humor, gratitude and love yielded the highest positive and significant correlations with positive affect, which make sense conceptually, given their more emotional nature.

Regarding negative affect, the five strengths most highly correlated negatively with negative affect were hope, humor, zest, honesty, and open-mindedness (all significant), which only partially agreed with the findings reported in previous studies and our assumptions (e.g., Littman-Ovadia and Lavy, 2012; Azañedo et al., 2014). Littman-Ovadia and Lavy (2012) found that negative affect yielded the highest negative correlations with hope, curiosity, zest, love, and self-regulation, while Azañedo et al. (2014) found that hope, zest, self-regulation, persistence, gratitude, and forgiveness showed the highest negative correlations. However, our results make sense and can be interpreted. Humor can be used as a coping strategy to reduce negative affect (Martin and Lefcourt, 1983). For many authors (e.g., Rogers, 1961), honesty (i.e., authenticity, integrity) is perceived as a fundamental aspect of well-being and a healthy functioning; departures from honesty are seen as reflecting psychopathology. In fact, Wood et al. (2008) found a negative association between authentic living and negative affect. Open-mindedness involves questioning our own thoughts and beliefs, and being able to change our mind in light of evidence. This is, in fact, the core of many psychological treatments (e.g., cognitive behavioral therapy). Open-mindedness reflects a high psychological flexibility, which has been proposed as the very essence of health (Kashdan and Rottenberg, 2010). When focusing on the lowest correlations with negative affect, spirituality/religiousness, modesty, appreciation of beauty and excellence, prudence and fairness occupied the last five positions in the ranking (all correlations were non-significant), which is highly consistent with previous studies and with our assumptions (e.g., Littman-Ovadia and Lavy, 2012; Azañedo et al., 2014).

When considering all components of subjective well-being jointly, the first five strengths most highly correlated with subjective well-being were hope, zest, humor, love, and perseverance, while modesty, spirituality/religiousness, appreciation of beauty and excellence, prudence, and fairness in general showed the lowest correlations with subjective well-being. However, this should not be interpreted automatically as if these strengths were not important for well-being. It is necessary to keep in mind that the indicators of well-being we used in this study focus on the subjective well-being of the individual. So although strengths such as prudence or modesty may not be related to the subjective well-being of the individual directly, as, for example, emotional strengths do, they might be fundamental for a healthy community life, which in turn affects the subjective well-being of the individual. Overall, correlations between strengths and positive affect and life satisfaction, i.e., the positive components of subjective well-being, were slightly larger than with negative affect, a finding that has been already observed and that is consistent with our assumptions (i.e., Littman-Ovadia and Lavy, 2012).

Table 6 | Z-tests and associated p values for comparing the correlations between strengths and well-being indicators across age groups.

	Life satisfaction						Positive affect						Negative affect					
	1 vs. 2		1 vs. 3		2 vs. 3		1 vs. 2		1 vs. 3		2 vs. 3		1 vs. 2		1 vs. 3		2 vs. 3	
	Z	P	Z	p	Z	p	Z	p	Z	p	Z	p	Z	p	Z	p	Z	p
1	−0.54	0.29	−0.65	0.26	−0.08	0.47	−0.75	0.23	−2.49	0.01	−1.81	0.04	1.10	0.14	1.46	0.07	0.32	0.37
2	−0.68	0.25	0.29	0.39	1.07	0.14	−0.07	0.47	−0.28	0.39	−0.22	0.41	1.84	0.03	1.33	0.09	−0.67	0.25
3	0.36	0.36	−0.10	0.46	−0.52	0.30	0.20	0.42	−0.72	0.24	−0.99	0.16	1.83	0.03	0.74	0.23	−1.29	0.10
4	−0.41	0.34	−0.90	0.18	−0.50	0.31	−0.16	0.44	−1.92	0.03	−1.87	0.03	0.68	0.25	0.76	0.22	0.04	0.48
5	−0.25	0.40	−0.80	0.21	−0.58	0.28	−1.05	0.15	−1.75	0.04	−0.69	0.25	1.43	0.08	1.58	0.06	0.07	0.47
6	−0.75	0.23	−1.95	0.03	−1.23	0.11	−1.40	0.08	−2.27	0.01	−0.84	0.20	1.15	0.13	1.77	0.04	0.58	0.28
7	−0.74	0.23	−0.52	0.30	0.29	0.39	−1.35	0.09	−0.98	0.16	0.48	0.32	0.61	0.27	0.38	0.35	−0.28	0.39
8	0.86	0.19	−0.21	0.42	−1.21	0.11	0.66	0.25	−0.14	0.44	−0.89	0.19	−0.22	0.41	−0.22	0.41	0.01	0.50
9	0.80	0.21	−0.13	0.45	−1.05	0.15	−0.95	0.17	−1.51	0.07	−0.53	0.30	0.93	0.18	1.11	0.13	0.13	0.45
10	−0.44	0.33	0.28	0.39	0.80	0.21	−1.24	0.11	−0.96	0.17	0.39	0.35	1.52	0.06	0.97	0.17	−0.69	0.25
11	2.12	0.02	1.38	0.08	−0.94	0.17	0.72	0.24	−0.19	0.42	−1.02	0.15	0.49	0.31	0.18	0.43	−0.36	0.36
12	0.82	0.21	0.99	0.16	0.12	0.45	−0.62	0.27	−1.38	0.08	−0.77	0.22	0.63	0.26	0.11	0.46	−0.60	0.27
13	0.37	0.36	−0.77	0.22	−1.25	0.11	0.94	0.17	−0.27	0.39	−1.35	0.09	−0.49	0.31	−0.35	0.36	0.18	0.43
14	−0.22	0.41	0.56	0.29	0.85	0.20	−0.29	0.39	−0.22	0.41	0.09	0.46	0.86	0.19	−0.68	0.25	−1.71	0.04
15	−0.21	0.42	0.19	0.42	0.44	0.33	−1.63	0.05	−1.10	0.14	0.68	0.25	1.63	0.05	−0.33	0.37	−2.21	0.01
16	−0.28	0.39	−1.40	0.08	−1.19	0.12	−2.50	0.01	−2.87	0.00	−0.23	0.41	1.40	0.08	1.62	0.05	0.15	0.44
17	0.53	0.30	0.46	0.32	−0.10	0.46	−1.91	0.03	−1.69	0.05	0.37	0.36	0.56	0.29	0.07	0.47	−0.56	0.29
18	0.73	0.23	1.04	0.15	0.29	0.39	−1.02	0.15	−0.33	0.37	0.80	0.21	0.44	0.33	−0.55	0.29	−1.09	0.14
19	0.10	0.46	−1.05	0.15	−1.25	0.11	−1.85	0.03	−1.40	0.08	0.61	0.27	1.73	0.04	0.66	0.25	−1.26	0.10
20	0.82	0.21	−0.44	0.33	−1.82	0.03	−0.40	0.34	−2.36	0.01	−2.07	0.02	0.10	0.46	1.32	0.09	1.30	0.10
21	0.82	0.21	−0.81	0.21	−1.80	0.04	−0.01	0.50	−1.60	0.05	−1.70	0.04	0.62	0.27	1.49	0.07	0.89	0.19
22	0.22	0.41	−0.15	0.44	−0.40	0.34	−1.76	0.04	−1.40	0.08	0.50	0.31	−0.14	0.44	−1.47	0.07	−1.42	0.08
23	0.24	0.41	0.44	0.33	0.20	0.42	−0.40	0.34	−0.35	0.36	0.07	0.47	1.01	0.16	0.12	0.45	−1.02	0.15
24	−0.66	0.25	−2.00	0.02	−1.39	0.08	−3.06	0.00	−4.05	0.00	−0.86	0.19	1.99	0.02	1.46	0.07	−0.71	0.24

1 vs. 2, difference between the 27–36 years group and the 37–46 years group; 1 vs. 3, difference between the 27–36 years group and the 47–57 years group; 2 vs. 3, difference between the 37–46 years group and the 37–46 years group; 1, creativity; 2, curiosity; 3, open-mindedness; 4, love of learning; 5, perspective; 6, bravery; 7, perseverance; 8, honesty; 9, zest; 10, love; 11, kindness; 12, social intelligence; 13, teamwork; 14, fairness; 15, leadership; 16, forgiveness; 17, modesty; 18, prudence; 19, self-regulation; 20, appreciation of beauty and excellence; 21, gratitude; 22, hope; 23, humor. 24, spirituality/religiousness.

When focusing on the second goal of this study, i.e., the examination of the relationship between strengths and well-being across age groups, we observed that in general these associations seem to slightly increase with age. This is consistent with Isaacowitz et al.'s (2003) results and with our hypotheses. Although the difference is small, this finding suggests, as Isaacowitz et al.'s (2003) suggested, that older adults, who are freed from family and professional constraints, might have more opportunities to apply strengths and, thus, benefit more from them. On the other hand, consistent with Erikson's account of development, it could be possible that, as individuals age, more functions are to be met, and more strengths might be helpful in fulfilling these different functions. These conditions would be reflected in a larger relationship between strengths and well-being. When comparing the size of the correlations between each strength and each component of well-being across the three age groups, a few differences were statistically significant. Specifically, the correlation between creativity and positive affect was significantly larger in the 47–57 years group than in the 27–36 years group. Also, the correlation between forgiveness and positive affect was significantly larger in the 47–57 years group and in the 37–46 years group than in the

27–36 years group. Likewise, the correlation between religiousness and positive affect was significantly different in the 27–36 years group than the correlation in the 37–46 years group and in the 47–57 years group. In fact, the negative significant correlation between positive affect and spirituality/religiousness in the 27–36 years group was an unexpected result that merits our attention. A possible explanation is that spirituality/religiousness is not a source of positive affect for this age group because society, increasingly secular and hedonistic, fails to provide enough opportunities to apply this strength.

When focusing on the relative dominance of some strengths in comparison with others, in the ranking of their relationship with life satisfaction, positive affect and negative affect, in each age group, this ranking was somehow different for the three age groups examined. Overall, for the three age groups, hope, zest and humor were among the first five strengths in the ranking of the relationship with well-being. This is consistent with our assumption that hope is relevant through the life span. However, also consistent with our hypotheses, in the 27–36 years group, which is roughly equivalent to the young adults in Erikson's theory (1982), strengths more related to the promotion of affiliation

and commitment with others seemed to be important for well-being. Specifically, strenghts such as kindness, honesty, social intelligence, and teamwork, occupied the first positions in the ranking of the association between strengths and the different components of subjective well-being. They also occupied the first positions when considering the mean absolute value of these three components. Nonetheless, these strengths did not occupy the first positions of this ranking in the 37–46 and 47–57 years groups. Also in line with our expectations, in the 37–46 years group (roughly equivalent to the adults in Erikson's theory), - along with hope, zest and humor - strengths that promote the maintenance of the world (i.e., family, work), such as leadership, love and perseverance, occupied dominant positions in the ranking of the association between strengths and the different components of subjective well-being. This was true not only with respect to the three different components of subjective well-being but also to the mean absolute value of these components. However, these strengths did not occupy the first positions of this ranking in the 27–36 and 47–57 years groups. Finally, again in agreement with our hypotheses, in the 47–57 years group, which could be somehow related to the old adults in Erikson's theory, besides hope, zest and humor, strengths that facilitate integration and a vital involvement with the environment, such as gratitude and love of learning, were among the first five strengths in the ranking of the association between strengths and the different components of subjective well-being, as well as with the mean absolute value of these three components. Nevertheless, these strengths did not occupy the first positions of this ranking in the 27–36 and 37–46 years groups. Older adults naturally begin to look backwards and remember episodes of their life (Butler, 1963). Gratitude might be useful in this process, as it might allow for a positive reinterpretation of the past (Wood et al., 2007) and facilitate integration. Love of learning might be more dominant in the ranking in this stage of life because individuals, more free from family and professional demands have more opportunities to develop their interests and hobbies, which contributes to an active lifestyle (Isaacowitz et al., 2003). Also, the Spearman correlations showed how the rank order of the relationships between strengths and well-being is less similar for widely separated age groups, i.e., for the 27–36 years group and the 47–57 years group. Overall, these results could be suggesting a gradual change in this rank order as individuals age.

Although the sample we used is representative of adults of working age living in Switzerland, one of the limitations of this study is that it does not include young participants below 27 or adults above 57. A sample that includes participants in these age groups would provide a more detailed account of the possible evolution of the association between character strengths and well-being. Also, given the cross-sectional nature of the age comparisons used in the study, it is not possible to conclude that the differences found are due to developmental trajectories. They could also be due to cohort effects. Future longitudinal studies could provide more evidence in relation to the differences in the association between character strengths and well-being over time. Regarding the size of the correlations between strengths and well-being, lower correlations were observed in comparison with other studies using the VIA-IS (e.g., Ruch et al., 2010). A possible explanation for this finding is that the CSRF uses only one item to assess each strength. This is a limitation of the instrument used, which, however, is particularly suited for large-scale longitudinal studies in which large samples compensate for a lower reliability, and economy of instruments is at a premium, as it was the case in this study.

Character is associated with well-being, and some strengths consistently seem to yield higher correlations with well-being than others. Until now, most studies had focused on samples whose representativeness was ill defined. In this study, with a more representative sample, some differences emerged with regard to previous studies, although hope, zest and love consistently yield the highest correlations with life satisfaction, also across different age groups. This finding is consistent with previous research. Future studies will indicate whether these findings are stable across other representative samples in other countries. Moreover, this study suggests the importance of considering age when studying the relationship between strengths and well-being, as some strengths might be particularly important for specific life stages. This relationship may have relevance for further research and practice.

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