


# Adaptation, Further Elaboration, and Validation of a Scale to Measure Hope as Perceived by People: Discriminant Value and Predictive Utility Vis-à-Vis Dispositional Hope

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## Abstract

Against the background of different psychological conceptualizations of hope, this article elaborates and validates a measure to assess hope as perceived by the general public adapting it from the hope and optimism subscale of the World Health Organization Quality of Life Spirituality, Religion and Personal Beliefs Questionnaire. The results presented here are part of a yearly Internet-based cross-sectional survey in Germany and Switzerland called Hope-Barometer, from which 4 samples of 3 different years with about 17,500 participants have been used. Following the results of exploratory and confirmatory factor analyses as well as convergent validity, discriminant value, and predictive utility, our findings suggest that the six items of the resulting Perceived Hope Scale exhibits robust psychometric properties, and that perceived hope is distinct and broader than dispositional hope, in which it relates not only to cognitive but also to spiritual, religious, and altruistic dimensions.

## Keywords

WHOQOL-SRPB, perceived hope, dispositional hope, self-efficacy, spirituality

## Purpose

The therapeutic value of hope in restoring and preserving health and well-being has been the focus of psychological and nursing research for decades (Elliott, 2005; Farran, Herth, & Popovich, 1995; Stotland, 1969). In recent years, discussions regarding the nature and measurement of hope have increased as well as the attempts to integrate into more complex and multidimensional theories and measures the many different facets the experience of hoping seems to entail. On the other hand, for many years now, there has been a call for new short and psychometrically sound instruments to measure hope as perceived by ordinary people (Rand & Cheavens, 2009; Tennen, Affleck, & Tennen, 2002; Tong, Fredrickson, Chang, & Lim, 2010). Employing data collected in the context of a yearly cross-sectional Internet survey called Hope-Barometer, this article has the purpose to elaborate and validate a scale to measure hope as perceived by the people (which we called Perceived Hope Scale [PHS]), using and adapting the hope and optimism subscale of the World Health Organization Quality of Life Spirituality, Religion, and Personal Beliefs Questionnaire (WHOQOL-SRPB) and to assess its usefulness, by comparing it with the Adult Dispositional Trait Hope Scale (Snyder

et al., 1991) to derive conclusions in relation to the differing psychological concepts of hope.

## Background

### *Different Conceptualizations of Hope*

Even though most theories of hope define the term as a positive expectation toward future outcomes, there are major divergences and even rival theories in psychology regarding the basic qualities of hope and what distinguishes hope from other constructs, such as optimism and self-efficacy.

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Current concepts of hope differ fundamentally with regard to core aspects and elements contained in its definition and the theoretical and philosophical roots they revert to. Basically, hope has been the object of research within a cognitive-behavioral framework of goal-related theories (Snyder, 1994, 2002; Stotland, 1969) as well as embedded in broader theories of basic human emotions (Averill, Catlin, & Chon, 1990; Fredrickson, 1998, 2004; Scioli et al., 1997). Furthermore, hope has been seen as something merely individual or something that is fundamentally related to others, be it other people or even a universal and transcendent higher power (Erikson, 1950; Godfrey, 1987; Marcel, 2010). Some theories highlight personal control and mastery over the outcomes hoped for, while others emphasize exactly the opposite, namely the perception of helplessness when hoping for something out of our direct control (Pruyser, 1986).

Currently, one of the most diffused theory of hope is that of Snyder (1994, 2000a, 2000b, 2002) and his colleagues, who characterize hope as individual mental willpower toward the fulfillment of personal goals. Dispositional hope, as defined by Snyder (2002), is a trait-like cognitive mind-set involving two basic components: (a) Agency as the basic perception of one's determination and motivation to initiate and sustain actions (willpower) to reach defined personal goals and (b) Pathways, the belief in one's own capabilities to create alternative routes in case of facing obstacles and setbacks (way-power). Snyder's theory of hope has a self-centered character, in which it refers to the person's perception in relation to his or her own efficacy to attain personal goals (Snyder et al., 1991). Key attributes of hopeful people are their tenacity and their active thinking and behaving toward ambitious personal goals. As he formulated it as follows: "Hope is the essential process of linking oneself to potential success" (Snyder, 1994, p. 18).

A common criticism to Snyder's theory of hope is that it is conceptually similar to other psychological constructs and that it neglects other elements of hope such as spirituality (Bruininks & Malle, 2005; Rand & Cheavens, 2009; Scioli, Ricci, Nyugen, & Scioli, 2011; Tennen et al., 2002; Tong et al., 2010). Self-efficacy, for example, describes people's beliefs in their own capabilities to produce desired effects by their own actions, which then determines the behavior they choose to engage in and to keep in the face of obstacles and challenges (Bandura, 1977). Snyder himself has noted the conceptual overlap between his theory of hope and other cognitive, goal-oriented constructs such as self-efficacy (Snyder, 2000b, 2002). However, in his eyes, self-efficacy as defined by Bandura (1977) is different from his definition of hope, since this construct considers only one dimension of his definition. There is a huge difference, he argues, between the "can" (capacity) in the case of self-efficacy and the "will" (intention) in the concept of hope. Furthermore, Dispositional Hope seems to be strongly

related to cognitive coping and personal resilience, since Agency and Pathways denote the cognitive and motivational ability to keep trying even after several setbacks. Some authors, on the contrary, consider that hope comes into play when the person is confronted with threatening or dreadful situations and does not feel capable to cope with them by means of his or her own resources alone (Fredrickson, 2013; Pruyser, 1986).

Alternative theories of hope intend to represent the complexity of the phenomenon by integrating qualitative research findings and other philosophical traditions (Dufault & Martocchio, 1985; Elliott & Olver, 2002; Farran et al., 1995; Herth, 1991; Staats & Stassen, 1985). Scioli and his colleagues, for example, defined hope as a future-directed, four-channel emotion network that comprises mastery, attachment, survival, and spiritual systems (or subnetworks), constructed from biological, psychological, and social resources (Scioli et al., 2011). Many researchers consider especially spirituality and religiosity to be two main elements or roots of hope (Dufault & Martocchio, 1985; Farran et al., 1995; Scioli et al., 2011). In general terms, spirituality has been described as a self-transcendent phenomenon, with a connection between the inner self and the universal whole, strengthening people's hope (Godfrey, 1987; Marcel, 2010). Peterson and Seligman (2004) included hope in their catalogue of character strengths common across cultures as belonging to the virtue of transcendence. For them, hope belongs to the virtue of transcendence because it goes beyond one's own knowledge and coping capabilities, and allows us to build connections to something bigger than ourselves that provides us with meaning, purpose, and basic beliefs. Several studies demonstrated that religious faith has positive effects on hope, life satisfaction, and mental well-being (Hasson-Ohayon, Braun, Galinsky, & Baider, 2009; Plante & Boccaccini, 1997).

In the general population, the most common mental problems are depression and anxiety. Several studies have shown that people with high levels of hope report lower levels of anxiety and depression (Arnau, Rosen, Finch, Rhudy, & Fortunato, 2007; Carretta, Ridner, & Dietrich, 2014; Elliott, 2005). Fredrickson (1998, 2004, 2013) has underlined the transformative and strengthening character of hope, as one of the 10 most frequently experienced positive emotions in daily life, with the effect of fostering personal growth and well-being. Because of this broadening and growth effect, hopeful people tend to display a more altruistic behavior, taking a long-term view of things, instead of satisfying short-term needs, thinking beyond the struggles of the present moment, and adopting moral values such as friendship, gratitude, and generativity (Cohn & Fredrickson, 2006; Fredrickson, 2002, 2013).

Past research studies have shown that hope was a significant predictor of psychological well-being, specifically of Life Satisfaction and Happiness (Alarcon, Bowling, &

Khazon, 2013; Bailey, Eng, Frisch, & Snyder, 2007; Staats, Wallace, & Anderson, 2010; Stassen & Staats, 1988). Life satisfaction is one of the cognitive components of subjective well-being and according to Diener and his colleagues (Diener, Emmons, Larsen, & Griffin, 1985), it is the result of comparing one's life circumstances to one's expectations, also predicting people's future behavior (Pavot & Diener, 2008). Besides the cognitive dimension of well-being, happiness has often been conceptualized as the affective side that is often nourished by hope (Lyubomirsky, Sheldon, & Schkade, 2005).

### *The Measurement of Hope*

The existing variety of hope concepts and theories has given rise to the development of different instruments for its measurement (Farran et al., 1995; Lopez, Snyder, & Pedrotti, 2003). Central questions in the design of hope studies have been the dimensionality and complexity (unimultidimensional or multidimensional) of the concept, the various study methods (qualitative or quantitative), the length and parsimony of scales (short or long), the applicability (culture specific or universal), the concreteness (general trait or specific situations), the approach (direct or indirect), and the psychometric properties, basically the convergent validity vis-à-vis-related constructs.

One of the most used measures of hope has been Snyder's Adult Dispositional Trait Hope Scale (Snyder et al., 1991), which includes four items to assess the motivational dimension of Agency and four items to assess the cognitive dimension of Pathways. This scale is short, easy to use, and has shown good psychometric properties (Babyak, Snyder, & Yoshinobu, 1993; Carifio & Rhodes, 2002; Snyder et al., 1991). Despite its wide use, Snyder's scale has increasingly come under criticism from many different standpoints: (a) It only assesses the rational and self-centered thought processes and neglects other dimensions like the relational and spiritual (Aspinwall & Leaf, 2002; Elliott & Olver, 2002; Farran et al., 1995; Scioli et al., 2011); (b) it only considers goals and aspects in life which one feels in control of, but is less applicable to situations considered to be outside one's direct control (Tong et al., 2010); (c) many items are nearly identical to items used to measure other constructs, such as coping and self-efficacy (Aspinwall & Leaf, 2002; Tennen et al., 2002); (d) Agency and Pathways thinking do not reflect how common people define hope for themselves (Averill et al., 1990; Bruininks & Malle, 2005; Tong et al., 2010).

Other authors have developed multidimensional scales to assess the cognitive, relational, affective, and/or spiritual elements included in their conceptualizations of hope. The mostly used instruments are the Hope Index Scale (Obayuwana et al., 1982) including 60 items and 5 subscales (ego-strength, religion, family support, education,

and economic assets), the Miller Hope Scale (Miller & Powers, 1988) with 40 items representing 3 subscales (satisfaction with self, others and life, avoidance of hope threats and anticipation of a future), the Nowotny Hope Scale (Nowotny, 1989) comprising 29 items and 6 subscales (confidence in outcome, relates to others, future is possible, spiritual beliefs, active involvement, and inner readiness) and the Herth Hope Scale (Herth, 1991) with 30 items covering 3 dimensions (cognitive-temporal, affective behavioral, and affiliative-contextual) based on Dufault and Martocchio (1985). More recently, Scioli and his colleagues (Scioli et al., 2011; Scioli, Scioli-Salter, Sykes, Anderson, & Fedele, 2016) have developed the Comprehensive Trait Hope Scale including 56 items belonging to 4 subscales (mastery, attachment, survival, and spirituality). All these measures have helped gain differentiated insights into the various elements of hope. However, important concerns regarding the utilization of these measures relate to the length and complexity of the questionnaires, the possible overlap with associated and similar constructs such as spirituality, and the cultural bias of their implicit definitions (e.g., Tennen et al., 2002; Tong et al., 2010). Therefore, a need for measures still exists that assess hope in a simple and direct manner, and that could be used in several cultures and with different population subgroups. For this, certain authors have been using a one-item hope measure for a quick assessment, for example, "I feel hopeful about the future" (Tong et al., 2010).

Other short scales incorporate multiple items of hope and optimism combining them into one unique dimension. This is the case of a subscale of the Spirituality, Religion, and Personal Beliefs (SRPB) questionnaire of the World Health Organization's Quality of Life Measure that includes two items for hope and two items for optimism (Skevington, Gunson, & O'Connell, 2013; WHOQOL-SRPB Group, 2002, 2006). The WHOQOL-SRPB is an instrument for measuring the spiritual quality of life using eight facets, one of them being hope and optimism. The main strength of the WHOQOL-SRPB is that it considers hope and optimism as directly perceived by the respondents. A further advantage is that it distinguishes hope/optimism from other related constructs (the other seven facets of the spiritual quality of life) such as spirituality, meaning in life, faith, and so on, instead of defining these constructs as elements of hope/optimism. The main disadvantage of this subscale, at least for our purposes, is that it mixes hope and optimism. Several authors such as Averill et al. (1990), Scioli et al. (1997), and Tennen et al. (2002) have pleaded for a clear distinction between hope and optimism. Consequently, for researchers that want to investigate the phenomenon of hope as perceived by the public the WHOQOL-SRPB subscale would not be, we argue, an appropriate measure. In fact, to our knowledge, there is no study until now that has used this subscale to investigate hope. Moreover, in our opinion, it

could be misleading, at least in Western Europe, to use hope and optimism as indicators to determine the level of spirituality and/or religiosity of the average population and vice versa, since a large number of people are optimistic and/or hopeful without being spiritual and/or religious, as exemplarily reported in a clinical study in the Netherlands by van der Geest et al. (2015).

The many definitions and measures of hope have resulted in a multifaceted picture of the phenomenon but have also led to a certain confusion and ambiguity of the term (Lopez et al., 2003). For many years, an open issue in hope research has been the development of instruments to measure how people perceive hope in everyday life, independently from the theoretical constructs defined by researchers (Averill et al., 1990). Looking at the existing hope measures, there is still a need to assess hope directly in order to gain access to individuals' unfiltered judgment of their own level of hopefulness and distinguishing hope from similar concepts (Rand & Cheavens, 2009; Tennen et al., 2002; Tong et al., 2010). For this end, a concise, simple, and psychometrically sound instrument for measuring hope as perceived by ordinary people, that could be applicable in different countries and population groups, can be of value. This measure should be free of bias in both directions, the cognitive as well as the spiritual, and should be applicable to people holding different belief systems.

### *Adaptation and Further Elaboration of a Scale to Measure Hope as Perceived by the Public*

To come up with a scale to measure hope as perceived by the public, we adapted and reformulated the four items of hope and optimism from the English version of the WHOQOL-SRPB questionnaire (Skevington et al., 2013; WHOQOL-SRPB Group, 2006) and added two additional items with aspects of hope not covered by the WHOQOL-SRPB. The first reformulation consisted in using the word "hope" (instead of sometimes "hope" and sometimes "optimism") in every item. The second change was to transform questions into statements to be consonant with current psychological scales. As observed by Elliott and Olver (2002), we took care to use hope in different forms (as nouns and adjectives, in singular and plural, related to the present and to the future). Furthermore, we added two additional items: one acknowledging the dialectical relation between hope and anxiety suggested in the literature (Elliott & Olver, 2002) and one to assess the degree of fulfillment of one's own hopes. Finally, several adaptations in the wording were done mainly to adapt it to nuances in the German language. These resulted in the following indicators: The item "How hopeful do you feel?" was converted into "I feel hopeful"; the item "To what extent are you hopeful about your life?" was turned into "I am hopeful with regard to my life"; the item "To what extent does being optimistic improve the

quality of life?" was converted into "Hope improves the quality of my life"; and the item "How able are you to remain optimistic in times of uncertainty?" was formulated as "Even in difficult times I am able to remain hopeful." The two additional items are "In my life, hope outweighs anxiety" and "My hopes are usually fulfilled." The major strength of the resulting PHS is that the six items do not mix hope with optimism but cover different elements of hope in part not covered by the WHOQOL-SRPB: The level of hope (PHS 3, PHS 5), the fulfillment of hope (PHS 2), the hope/anxiety duality (PHS 1), the effect of hope (PHS 4), and the special (difficult) situations in which hope arises (PHS 6).

### *Our Study: Validation of the Perceived Hope Scale*

The main purpose of our study is to validate the PHS as adapted from the WHOQOL-SRPB subscale (Skevington et al., 2013; WHOQOL-SRPB Group, 2006) and to assess the discriminant value of the scale in comparison with the ADHS. We would like to achieve our purpose in five steps as outlined in Table 1.

Steps 1 and 2 are dedicated to evaluate the structural validity and reliability of the resulting PHS and to assess invariance across groups. Since the PHS should be free from religious/spiritual bias, we tested if the items had a common meaning for people with and without religious/spiritual orientation. The goal in Step 3 is to investigate the discriminant value of the PHS against the ADHS. Our hypothesis is that the ADHS does not measure hope as perceived by the general public (at least among the German-speaking population) and that the ADHS and the PHS will be clearly distinguishable from each other. Step 4 has two objectives: First, to measure convergent validity of the PHS with other hope-related psychological constructs described in the theory chapter. Second, to compare correlations in order to find out the main commonalities and differences between the PHS and the ADHS. The objective of Step 5 is to assess the predictive and incremental utility of the PHS vis-à-vis the ADHS, since a new scale such as the PHS can be of value if it accounts for additional variance beyond that accounted for by a well-established measure such as the ADHS.

## **Method**

### *Participant Samples*

The results of the studies we refer to, belong to four surveys completed in Germany and in German-speaking Switzerland in November 2013, November 2014, and November 2015. Data collection was done by Internet, thanks to two of the largest German and Swiss national newspapers drawing



**Table 1.** Outline of Our Study.

Steps	Objectives	Samples and data analysis
Step 1: Structural validity	<ul style="list-style-type: none"> <li>Assessment of the one-factor structure of the PHS and its reliability</li> </ul>	Using Sample 1: <ul style="list-style-type: none"> <li>Exploratory factor analysis</li> <li>Parallel analysis</li> <li>Cronbach alpha reliability measure</li> </ul>
Step 2: Structural validity	<ul style="list-style-type: none"> <li>Validation of the one-factor structure of the PHS</li> <li>Assessment of item and construct reliability</li> <li>Assessment of invariance between groups with different religious beliefs</li> </ul>	Using Sample 2: <ul style="list-style-type: none"> <li>Confirmatory factor analysis</li> <li>Measurement invariance</li> </ul>
Step 3: Discriminant value	<ul style="list-style-type: none"> <li>Assessment of the discriminant value of the PHS vis-à-vis the ADHS and its subconstructs</li> </ul>	Using Sample 3: <ul style="list-style-type: none"> <li>Confirmatory factor analysis</li> <li>Nested models comparison</li> </ul>
Step 4: Convergent validity	<ul style="list-style-type: none"> <li>Assessment of the convergent validity of the PHS with related constructs</li> <li>Assessment of commonalities and differences between the PHS and the ADHS</li> </ul>	Using Sample 4: <ul style="list-style-type: none"> <li>Correlation indices</li> <li>Correlation comparison</li> </ul>
Step 5: Predictive and incremental utility	<ul style="list-style-type: none"> <li>Assessment of the predictive and incremental utility of the PHS vis-à-vis the ADHS</li> </ul>	Using Sample 4: <ul style="list-style-type: none"> <li>Hierarchical regression analysis</li> </ul>

Note. PHS = Perceived Hope Scale; ADHS = Adult Dispositional Hope Scale.

great attention to our survey every year and linking our questionnaires to their webpages over a period of 2 to 3 weeks. Thanks to that, our samples include a total of 17,594 participants of different ages, with different educational backgrounds and family status (see composition of the samples in Table 2). For data analysis, we only used the fully answered questionnaires of participants aged 18 years and older, and removed all those files with obviously incorrect answers, that is, when a large number of questions were rated with only one option (0 or 1). The percentage of removed cases was between 4.7% and 6.7%. In our analysis, we used threshold values of skewness <2 and kurtosis <3 (West, Finch, & Curran, 1995) to assess if data distribution is excessively abnormal. Since in 2014 and 2015, we defined all the questions as compulsory, we are pleased to report that we did not have any missing values in the Samples 2, 3, and 4. Missing values in Sample 1 were listwise excluded from the analysis. All the studies were performed using SPSS (IBM, 2014) and AMOS 23 (Arbuckle, 2014) as software.

## Measures

### Perceived Hope Scale

The six items of the PHS are rated on a 6-point Likert-type scale going from 0 = *strongly disagree* to 5 = *strongly agree*. In our study, the PHS revealed good internal consistency with Cronbach alphas between .87 and .89. The order of the six items was as follows (German version in the appendix):

- PHS 1: In my life, hope outweighs anxiety.
- PHS 2: My hopes are usually fulfilled.

- PHS 3: I feel hopeful.
- PHS 4: Hope improves the quality of my life.
- PHS 5: I am hopeful with regard to my life.
- PHS 6: Even in difficult times, I am able to remain hopeful.

### Adult Dispositional Trait Hope Scale

After having evaluated the structural validity and reliability of the PHS the focus was placed on testing discriminant value of the PHS with respect to the ADHS. As explained in the conceptual part of this article, many authors have started to question if the ADHS really measures what it intends to measure. Therefore, our objective is to assess if the PHS is measuring something different than the ADHS. Snyder's ADHS (Snyder et al., 1991) includes four items to assess the motivational dimension of Agency and four items to assess the cognitive dimension of Pathways. In past studies, Cronbach alpha coefficients for the overall ADHS ranged from .74 to .84, from .71 to .76 for the four items of the Agency subscale, and from .63 to .80 for the four items of the Pathways subscale (Snyder et al., 1991). The distribution of the ADHS tends to be skewed toward the positive side of the scale.

*Scales for Assessing Convergent Validity.* The next step is dedicated to assess convergent validity of the PHS and its commonalities and differences in comparison with the ADHS using several constructs that different authors have related to hope. For practical reasons, our aim was to employ short scales, but with sound psychometric properties. German versions already existed for several well-known measures, and were consequentially adopted. In those cases where no

**Table 2.** Demographic Structure of the Four Samples Used for Our Studies.

	Sample 1: Germany (November 2013)	Sample 2: Germany (November 2014)	Sample 3: Switzerland (November 2014)	Sample 4: Switzerland (November 2015)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Total	2,584 (100)	4,454 (100)	4,177 (100)	6,379 (100)
Gender				
Male	1,220 (47.2)	2,093 (47.0)	2,263 (54.2)	2,568 (40.3)
Female	1,364 (52.8)	2,361 (53.0)	1,914 (45.8)	3,811 (59.7)
Age (years)				
18 to 29	857 (33.2)	1,439 (32.3)	1,440 (34.5)	2,335 (36.6)
30 to 39	498 (19.3)	996 (22.4)	745 (17.8)	1,200 (18.8)
40 to 49	443 (17.1)	807 (18.1)	720 (17.2)	1,012 (15.9)
50 to 59	435 (16.8)	720 (16.2)	646 (15.5)	1,041 (16.3)
60 to 69	275 (10.6)	395 (8.9)	462 (11.1)	596 (9.3)
70 to 79	70 (2.7)	87 (2.0)	147 (3.5)	178 (2.8)
80 and older	6 (0.2)	10 (0.2)	17 (0.4)	17 (0.3)
Highest education				
Not finished school	22 (0.9)	44 (1.0)	23 (0.6)	46 (0.7)
Obligatory school	131 (5.1)	345 (7.7)	287 (6.9)	390 (6.1)
Secondary school	206 (8.0)	466 (10.5)	298 (7.1)	288 (4.5)
High school	236 (9.1)	386 (8.7)	276 (6.6)	361 (5.7)
Professional education	1,237 (47.9)	1,874 (42.1)	1,423 (34.1)	2,677 (42.0)
Higher education	247 (9.6)	404 (9.1)	1,024 (24.5)	1,474 (23.1)
University	505 (19.5)	935 (21.0)	846 (20.3)	1,143 (17.9)
Family status				
Living with parents	244 (9.4)	270 (6.1)	503 (12.0)	851 (13.3)
Single/unmarried	480 (18.6)	922 (20.7)	720 (17.2)	990 (15.5)
Living in a partnership	707 (27.4)	1,313 (29.4)	1,191 (28.5)	1,804 (28.3)
Married	896 (34.7)	1,574 (35.3)	1,407 (33.7)	2,224 (34.9)
Divorced/separated	182 (7.0)	254 (5.7)	243 (5.8)	427 (6.7)
Widowed	46 (1.8)	78 (1.8)	59 (1.4)	83 (1.3)
Something different	29 (1.1)	43 (1.0)	54 (1.3)	—

validated translations were available, members of the German team of the Hope-Barometer research project translated the items and cross-checked them.

**Self-Efficacy.** To measure self-efficacy, we utilized the German version of the General Self-Efficacy Scale with 10 items developed by Schwarzer and Jerusalem (1995, 1999), using a 4-point Likert-type scale from 0 to 3. In past research projects, the General Self-Efficacy Scale yielded internal consistency alpha values between .75 and .91. Self-efficacy has shown moderate correlations to other constructs, such as optimism and proactive coping, as well as to Agency.

**Resilience.** We used the six items' Brief Resilience Scale (BRS) scored on a 5-point Likert-type scale from 1 to 5 (Smith et al., 2008). In past studies, the BRS showed good internal consistency with Cronbach alpha's ranging from .80 to .91. The BRS has been positively correlated with optimism, active coping, social support, and purpose in life,

and negatively correlated with pessimism, anxiety, depression, and negative interactions.

**Spiritual Beliefs.** We employed the four items of the Importance of Spiritual Beliefs in Life subscale of the Spirituality Questionnaire developed by Parsian and Dunning (2009) to be rated on a 4-point scale (1 to 4). These four items revealed a very good internal consistency of  $\alpha = .91$  in the validation study.

**Religious Faith.** The Santa Clara Strength of Religious Faith Questionnaire evidenced significant positive correlations to adaptive coping and to dispositional hope (Plante & Boccacini, 1997). The short-form of the Santa Clara Strength of Religious Faith Questionnaire (Storch, Roberti, Bravata, & Storch, 2004) reduced to five items, scored on a 4-point scale (1 to 4), has reached excellent internal consistency ( $\alpha = .95$ ).

**Gratitude.** Gratitude was measured with a six-item questionnaire developed by McCullough, Emmons, and Tsang (2002), to be rated on a 7-point scale (1 to 7). The authors

reported a good reliability alpha coefficient of .82 and positive correlations with Agency ( $r = .67$ ) and Pathways ( $r = .42$ ).

**Generativity.** Generativity has been defined as a dimension of self-transcendence, especially doing or creating things of lasting value and for future generations (Schnell, 2009). Six items of the Sources of Meaning and Meaning in Life Questionnaire (Schnell & Becker, 2007) are dedicated to score generativity on a 6-point scale from 0 to 5. The alpha coefficient reported was satisfactory (.76).

**Helping Others.** Helping others is a prosocial attitude and behavior that positively correlates with empathy, social responsibility and altruism, and negatively correlates with selfishness. We measured this attitude with a short-form of the Helping Attitude Scale (Nickell, 1998), employing 7 items with a 5-point scale from 1 to 5. Cronbach alpha reliability was reported to be .86.

**Depression and Anxiety.** The ultra-brief Patient Health Questionnaire for Depression and Anxiety (PHQ-4) is a composite four-item scale to measure both phenomena (Kroenke, Spitzer, Williams, & Löwe, 2009). Since the questionnaire asks the participants to assess how often they are bothered by certain negative feelings, responses are scored from 0 (*not at all*), 1 (*several days*), 2 (*more than half the days*) to 3 (*nearly every day*). The alpha coefficient reported in the validation study was .85.

**Measures for Assessing Predictive and Incremental Utility.** The goal of our last step is to assess predictive and incremental utility of the PHS in comparison with the ADHS. For this purpose, three dependent variables were chosen. The first two dependent variables were Satisfaction with Life and Happiness.

The *Satisfaction with Life Scale* (SLS) was designed to assess global life satisfaction, defined as the comparison of life circumstances with one's expectations. The SLS consists of 5 items scored on a 7-point scale from 1 to 7. Diener et al. (1985) reported a coefficient alpha of .87.

The *Subjective Happiness Scale* (SHS) assesses happiness from the respondent's own perspective. The four items represent a subjective and global judgment about the extent to which people feel happy or unhappy (Lyubomirsky & Lepper, 1999). The possible scores go from 1 to 7. The reported Cronbach alphas ranged from .79 to .94.

The third dependent variable we employed is related to the individual's outlook on one's private life for the coming year. Since most theories of hope converge on defining hope as a positive expectation toward positive future outcomes, we asked respondents to rate the statement "Regarding my private life in 2016, I am . . ." using a 5-point Likert-type scale going from 1 (*very pessimistic*) to 5 (*very optimistic*).

## Data Analysis and Results

### Step 1: Structural Validation of the PHS Through Exploratory Factor and Parallel Analysis

**Data Analysis.** To evaluate the suggested one-factor structure of the six items of the PHS, two different methods were performed based on the German sample 1 ( $n = 2,584$ ). First, an exploratory factor analysis (EFA) was conducted using the principal axis factoring (PAF) method and oblique Promax rotation. The number of factors to be retained was selected according to Kaiser's criterion, using eigenvalues of 1 and higher. Since Kaiser's criterion of eigenvalues greater than 1 tends to overestimate, and sometimes, also to underestimate the number of components, we performed, in a second step, the more robust parallel analysis (PA) procedure (Horn, 1965). Using O'Connor's SPSS-syntax (O'Connor, 2000), we ran a normally distributed random data simulation PA with the common factor analysis method (PAF), defining 1,000 data sets to be generated using the same number of observations and the same number of variables as the original data set. To be conservative, we defined eigenvalues of the 95th percentile to be calculated. The recommended number of factors to be retained is the number of original data's eigenvalues that are greater than the corresponding simulated data eigenvalues (Hayton, Allen, & Scarpello, 2004). Furthermore, the Cronbach alpha reliability coefficient was calculated. Before starting with the analyses, we assessed the measures of sampling adequacy (MSA), the Kaiser-Meyer-Olkin (KMO) level (Kaiser, 1974), and evaluated the sample distribution.

### Results

**Preliminary results.** Inspection of all variables showed that the data are moderately skewed to the right side of the scale (values ranging from  $-.59$  to  $-.91$ ) but within the suggested cutoff of  $|2.0|$ , and with low kurtosis values ranging from  $-.06$  to  $.97$  (cutoff at  $|3.0|$ ; West et al., 1995). This suggests that the sample does not severely deviate from normality. The KMO measure of sampling adequacy reached a level of .89, and the Bartlett's test of sphericity was significant ( $p < .001$ ). The sample adequacy measures (MSA) for the single items ranged between .85 and .93 (see Table 3). These statistics indicate that the sample is adequate for factor analysis.

**Exploratory factor analysis.** The EFA revealed a one-factor model with an eigenvalue of 3.71, explaining 54.85% of the variance. The factor loadings ranged from .61 to .86 (see Table 3). The items showed good reliability at Cronbach  $\alpha = .87$  ( $M = 3.31$ ;  $SD = .90$ ). Corrected correlations between items varied from .56 to .79 (see Table 3).

**Parallel analysis.** The results of the PA exhibited in Table 4 indicate that the result of the previous EFA could be

**Table 3.** Descriptive Statistics, Item–Total Correlations, and Factor Loadings of the PHS Items.

	<i>M</i>	<i>SD</i>	<i>MSA</i>	Corrected item– total correlations	Factor loadings
PHS 1	3.25	1.27	0.94	.58	.62
PHS 2	2.92	1.09	0.90	.65	.71
PHS 3	3.19	1.14	0.87	.77	.84
PHS 4	3.58	1.08	0.92	.56	.61
PHS 5	3.56	1.10	0.86	.79	.86
PHS 6	3.35	1.21	0.89	.69	.76

Note. *MSA* = measure of sample adequacy; PHS = Perceived Hope Scale.

**Table 4.** Parallel Analysis Results: Actual and Random Eigenvalues.

Root	Actual eigenvalue	Average eigenvalue	95th Percentile eigenvalue
1	3.224	0.067	0.094
2	0.010	0.036	0.056
3	0.002	0.012	0.028
4	−0.060	−0.009	0.003
5	−0.107	−0.033	−0.017
6	−0.136	−0.062	−0.041

confirmed, since only the first actual eigenvalue (3.224) is greater than the corresponding eigenvalues from the random data (average = .067 and 95th percentile = .094).

To summarize, the analyses performed in Step 1 suggest that the six items load strongly on only one factor, endorsing the one-factor structure of the PHS as theoretically conceived, and that the scale reveals a reliable internal consistency.

### Step 2: Structural Validation of the PHS Through Confirmatory Factor Analysis

**Data Analysis.** Before starting the CFA, the results of an EFA with the six PHS items (PAF with Promax rotation, eigenvalues >1) from the new sample will be reported. The model tested using CFA was the one-factor solution with all six items loading on one unique latent variable. The CFA has been performed on the German sample 2 ( $n = 4,454$ ) using the maximum likelihood method based on a covariance matrix. Afterward, we tested the measurement invariance of the PHS across two distinct groups with different religious orientations, one group said to be of Christian faith (Catholic, Protestant, or another Christian faith) and another group of individuals said to be without religion or specific faith and that do not consider themselves spiritual at all. Measurement invariance was tested in a stepwise incremental procedure, going from the least restricted solution to models that entail increasingly restrictive constraints

(see Brown, 2006): (a) we started with separate CFA models to test the one-factor structure for each group under evaluation; (b) then, we conducted the simultaneous test for configurational invariance to assess if the one-factor form was the same for the different groups, and used this equal form model as baseline for the next models; (c) we then calculated metric invariance, constraining the single factor loadings. Metric invariance tests whether the measure has the same structure and meaning for the different groups of respondents; (d) the next step was to evaluate scalar invariance, which implies that the meaning of the measure (the factor loadings), and also the levels of the underlying items (intercepts), are equal across groups. Scalar invariance is needed when researchers want to compare scores between groups on the latent variable; (e) finally, we also tested the full uniqueness invariance by fixing the indicator residuals, assessing if the explained variance for every item was the same across groups, and endorsing that the latent construct was measured identically across groups.

The resulting CFA models were evaluated using the following goodness-of-fit indices: chi-square ( $\chi^2$ ), root mean square error of approximation (RMSEA), standardized root mean residual (SRMR), comparative fit index (CFI) and the Tucker–Lewis index (TLI). Chi square and chi-square differences are typically used to assess and compare models, but the indices are usually influenced by sample size, which is probably the case in all our studies. RMSEA values close to, or lower than, .08 indicate a reasonable, and around .06 and lower, a good model fit (Browne & Cudeck, 1993), similar to SRMR values close to or lower than .08 (Hu & Bentler, 1999). CFI and TLI values in the range between .90 and .95 are considered to be evidence of an acceptable model fit (Bentler, 1990; Bentler & Bonett, 1980), and above .95 of a good model fit (Hu & Bentler, 1999). To evaluate the invariance tests, the recommended threshold values for comparing the baseline model (equal form) and the nested models are a decrease in CFI and TLI equal to or lower than .01, a change in RMSEA of .015 or less, and a maximum change in SRMR of .03 for metric variance, and of .01 for scalar variance (Chen, 2007).

Furthermore, for the original model, we evaluated the indicator and factor reliabilities. Good item reliability is indicated by squared multiple correlation values >.4 (Bagozzi & Baumgartner, 1994). The threshold for a good factor or composite reliability is a value >.6 (Bagozzi & Yi, 1988). Additionally, the average variance extracted (AVE) for each factor, a measure of convergent validity of the items, should be >.5 (Fornell & Larcker, 1981).

### Results

**Preliminary results.** The inspection of the skewness and kurtosis indices for the six PHS variables in Sample 2 proved to be near to normal (values ranged from −.632 to −.918 for skewness and from −.076 to .826 for kurtosis).



**Table 5.** Fit Indices and Test of Measurement Invariance of the PHS.

	$\chi^2$	df	$\chi^2/df$	RMSEA [90% CI]	SRMR	CFI	TLI
Total sample 2 ( $n = 4,454$ )	201.76	9	22.48	0.069 [0.061, 0.078]	0.019	0.986	0.977
Religious invariance							
Christian denomination ( $n = 2,494$ )	125.93	9	13.99	0.072 [0.061, 0.084]	0.021	0.985	0.975
Nondenominational ( $n = 1,676$ )	62.83	9	6.98	0.060 [0.046, 0.074]	0.019	0.990	0.983
Configurational invariance	127.78	18	7.10	0.050 [0.042, 0.059]	0.019	0.986	0.976
Metric invariance	132.71	23	5.77	0.045 [0.037, 0.052]	0.020	0.986	0.981
Scalar invariance	139.99	29	4.83	0.040 [0.033, 0.047]	0.020	0.985	0.985
Full uniqueness	158.92	36	4.41	0.038 [0.032, 0.044]	0.022	0.984	0.987

Note. *df* = degrees of freedom; RMSEA = root mean square error of approximation; SRMR = standardized root mean residual; CFI = comparative fit index; TLI = Tucker–Lewis index; PHS = Perceived Hope Scale; CI = confidence interval.

The KMO index was .90 and the Bartlett's test of sphericity was significant ( $p < .001$ ); therefore, the sample can be considered to be adequate for factor analysis. The EFA of the six items confirmed the one-factor model with an eigenvalue of 3.90, explaining 58.58% of the variance. The factor loadings for the six items ranged from .66 to .85. The correlations between the items were all significant ( $p < .001$ ), ranging from .42 to .71. The Cronbach  $\alpha = .89$  ( $M = 3.24$ ;  $SD = .96$ ) indicated a good reliability of the scale.

**Factorial structure.** In the CFA of the whole sample model, all six items correlated significantly with each other at  $p < .001$ , and every single loading estimate turned out to be significant at the .01 level. Unstandardized loading estimates ranged from .807 to 1.223. The  $\chi^2$  test suggests that the estimates do not fit the data well ( $p = .000$ ), and that the model should thus be rejected. However, this may be because the large size of the sample inflates the index and makes it inadequate as a goodness-of-fit measure (Brown, 2006). All the other fit indices presented in Table 5 indicate a good fit to the data (RMSEA = 0.069; SRMR = 0.019; CFI = 0.986; TLI = 0.977). Furthermore, all squared multiple correlation values of the completely standardized solution were  $>.4$  (.481 to .741). The factor or composite reliability was good ( $= .89$ ) and the AVE = .71 exceeded the threshold value of  $>.5$ .

**Invariance across groups with different religious orientations.** Finally, we tested measurement invariance across two groups of participants with different religious orientations (Christians and nondenominational). The overall fit indices exhibited in Table 5 reveal that the one-factor model achieves good model fit in both groups. The freely estimated factor loadings were statistically significant ( $p < .001$ ) in both groups, and completely standardized loadings ranged from .639 to .864. Notably, overall fit indices of the nondenominational group are better than those for the Christian group (e.g., RMSEA = 0.060 vs. 0.072). The equal form provided a good fit to the data, suggesting rea-

sonable support for configurational invariance across the two groups. Using the equal form as a baseline model, the equal factor loading solution to measure metric invariance produced acceptable goodness-of-fit indices ( $\Delta$ RMSEA = 0.005;  $\Delta$ SRMR =  $-0.001$ ;  $\Delta$ CFI = 0.000;  $\Delta$ TLI =  $-0.005$ ). The equal measurement intercepts model to measure scalar invariance was also found to have a good fit to the data ( $\Delta$ RMSEA = 0.010;  $\Delta$ SRMR =  $-0.001$ ;  $\Delta$ CFI = 0.001;  $\Delta$ TLI =  $-0.009$ ). This means that the PHS reveals strong invariance, and that comparison of factor scores between the two religious groups is possible. Strict invariance (full uniqueness) was achieved by the indices  $\Delta$ RMSEA = 0.012,  $\Delta$ SRMR =  $-0.003$  and  $\Delta$ CFI = 0.002 but just not by  $\Delta$ TLI =  $-0.011$ .

In sum, all indices of the CFA suggest a coherent fit of the data when testing the unidimensional factor structure. The six items showed a good item and composite reliability. Furthermore, the CFA proved that the scale is adequate for different population subgroups in terms of religious orientation.

### Step 3: Discriminant Value of the PHS in Comparison With the ADHS

The purpose of Step 3 is to assess, by means of CFA, if hope, as measured by the PHS, can be psychometrically distinguished from hope as measured by the ADHS and its subconstructs Agency and Pathways.

**Data Analysis.** For this study, we used the Swiss sample 3 ( $n = 4,177$ ) and the maximum likelihood method based on a covariance matrix.

Three CFA models were calculated: Model 1 represents the one-factor solution, loading all 14 observed indicators on one common latent variable for hope. Model 2 consists of two latent variables, one for the six PHS and one for the eight ADHS items. Model 3 contains three latent variables, one for the six PHS, one for the four Agency, and one for the four Pathways indices.

**Table 6.** Fit Indices for the Comparative CFA.

Models	$\chi^2$	df	$\chi^2/df$	ECVI	RMSEA	SRMR	CFI	TLI
Model 1 (one factor)	7649.65	77	99.36	1.852	0.153	0.093	0.766	0.724
Model 2 (two factors)	2287.43	76	30.10	0.562	0.083	0.047	0.932	0.918
Model 3 (three factors)	1859.30	74	25.13	0.460	0.076	0.044	0.945	0.932

Note. *df* = degrees of freedom; ECVI = expected cross-validation index; RMSEA = root mean square error of approximation; SRMR = standardized root mean residual; CFI = comparative fit index; TLI = Tucker–Lewis index.

**Table 7.** Correlations and Squared Correlations of Factor Estimates Taking the Completely Standardized Solution.

	Correlation estimates, <i>r</i>	Squared correlations, <i>r</i> <sup>2</sup>
PHS ↔ Agency	.65	.42
PHS ↔ Pathways	.63	.40
PHS ↔ ADHS	.66	.44
Agency ↔ Pathways	.88	.77

Note. PHS = Perceived Hope Scale; ADHS = Adult Dispositional Hope Scale. All correlations significant at  $p < .001$ .

The models were evaluated using the same goodness-of-fit indices as in Step 2 ( $\chi^2$ , RMSEA, SRMR, CFI, and TLI). Additionally, the expected cross-validation index (ECVI) was used to compare models differing in the number of factors (Browne & Cudeck, 1993). Models with lower ECVI values are judged to fit the data better. Furthermore, we assessed indicator and factor reliabilities (Bagozzi & Baumgartner, 1994; Bagozzi & Yi, 1988). Finally, the discriminant value was evaluated in two ways. Using the Fornell–Larcker criteria (Fornell & Larcker, 1981), we compared the AVE of the single factors with the squared correlations between factors. An AVE higher than the squared factor correlations between factors is a good indicator for discriminant value. Furthermore, we generated nested models for both the two and the three factor models, by fixing the covariance between the factors to 1 (Bentler & Bonett, 1980). Using the  $\chi^2$  difference test and additionally comparing all other goodness-of-fit indices, we then evaluated whether the fit of the more restricted nested models was worse than the parent models, giving additional support for discriminant value.

## Results

**Preliminary results.** Sampling adequacy measures of the Swiss sample 3 were good (KMO = .94 and MSA > .86 for the two scales). The values of the 14 items under study were slightly skewed to the positive side of the scale, but still within the range of |2|, which allows us to assume an approximate normal distribution of the data and its adequacy for factor analysis. All 14 indicators of the PHS and the ADHS correlated significantly with each other at  $p < .001$ . The six items of the PHS revealed a good Cronbach  $\alpha = .89$  ( $M = 3.42$ ;  $SD = 0.96$ ) alike the 8 items of the ADHS

( $\alpha = .89$ ;  $M = 3.68$ ;  $SD = .80$ ) and similar to the four items of Agency ( $\alpha = .83$ ;  $M = 3.59$ ;  $SD = 0.89$ ) and the four items of Pathways ( $\alpha = .82$ ;  $M = 3.76$ ;  $SD = 0.83$ ).

**Results of the comparative CFA.** Bivariate Pearson correlations of the PHS with the ADHS ( $r = .59$ ), Agency ( $r = .56$ ) and Pathways ( $r = .54$ ) were moderately high and significant at  $p < .01$ . In all models, every single loading estimate turned out to be significant at the .01 level. In all models, the  $\chi^2$  test suggested that the estimates do not fit the data well ( $p = .000$ ), but this again might be a result of the large size of the sample ( $n = 4,177$ ). The resulted goodness-of-fit indices of the three evaluated models are exhibited in Table 6. The goodness-of-fit indices of the one-factor solution indicate that the 14 items do not represent an overall well-defined and delimited construct that could be called Hope. Model 2 with the two factors PHS and ADHS, and Model 3 with the three factors PHS, Agency and Pathways display an acceptable model fit. All goodness-of-fit indices imply that the PHS and the ADHS (and its two subconstructs) are very probably related to different latent factors and therefore measuring different concepts.

In Model 2, the PHS and the ADHS were moderately correlated ( $r = .66$ ; see Table 7), as well as in Model 3 the PHS with Agency ( $r = .65$ ) and Pathways ( $r = .63$ ). Correlations <.85 are often considered as cutoff criteria for good discriminant value (Brown, 2006). All latent variables achieved a good factor reliability: PHS = .90, ADHS = .89, Agency = .84, and Pathways = .82. Additionally, the AVE for each factor was also high in all cases: PHS = .71, ADHS = .69, Agency = .69, and Pathways = .66. To assess the discriminant value of the single factors, Fornell and Larcker (1981) proposed to compare the AVE of each factor with the squared correlations of the factors. Table 7 presents the squared correlations of the factors. As the AVE of the PHS (.71) is higher than the squared correlations of the PHS to the ADHS (.44), Agency (.42), and Pathways (.40), it can be concluded that the PHS is distinct from the ADHS, as well as from the single subconstructs Agency and Pathways.

In order to provide additional support for discriminant value of the PHS vis-à-vis the ADHS, Agency, and Pathways, we used the nested model comparison procedure as recommended by Bentler and Bonett (1980). Using Model 2 (two-factor model) first and then Model 3 (three-factor model) as

**Table 8.** Fit Indices for the Nested Models of the Two- and the Three-Factor Models.

Nested models	$\chi^2$	$\Delta\chi^2$	ECVI	RMSEA	SRMR	CFI	TLI
Two-factor model							
PHS-ADHS cov = 1	2929.87	642.44	0.715	0.137	0.110	0.912	0.896
Three-factor model							
PHS-Agency cov = 1	2337.92	478.61	0.574	0.085	0.118	0.930	0.915
PHS-Pathways cov = 1	2370.65	511.35	0.582	0.086	0.122	0.929	0.914

Note. ECVI = expected cross-validation index; RMSEA = root mean square error of approximation; SRMR = standardized root mean residual; CFI = comparative fit index; TLI = Tucker–Lewis index.

**Table 9.** Cronbach Alphas, Mean Values, Standard Deviations, Pearson Correlations, and Correlations Comparisons.

	Cronbach $\alpha$	<i>M</i>	<i>SD</i>	PHS, <i>r</i>	ADHS, <i>r</i>	<i>z</i>	<i>p</i>
Self-Efficacy	.89	2.04	0.49	.49	.74	-17.94	.000
Resilience	.85	3.45	0.80	.41	.49	-4.59	.000
Spiritual Beliefs	.97	1.91	0.98	.24	.13	6.44	.000
Religious Faith	.92	1.76	0.85	.21	.07	8.08	.000
Gratitude	.76	5.51	1.02	.51	.42	5.26	.000
Generativity	.84	3.25	0.99	.33	.30	1.88	.060
Helping Others	.89	4.05	0.70	.22	.15	4.09	.000
Depression/Anxiety	.85	0.58	0.64	-.51	-.47	2.97	.003
PHS	.88	3.42	0.90	—	.59		
ADHS	.88	3.62	0.77	—	—		

Note. PHS = Perceived Hope Scale; ADHS = Adult Dispositional Hope Scale. All correlations significant at  $p < .001$ .

parent models, we generated nested models, fixing the covariance between the two latent factors to 1. Using the  $\chi^2$ -difference test, we then compared the fit of the nested models with the fit of the parent model. Since all  $\Delta\chi^2$  value exhibited in Table 8 are clearly higher than the critical value of 3.84 ( $df = 1$ ;  $\alpha = .05$ ), it can be assumed that the PHS is measuring something different than the ADHS, Agency, and Pathways. Since the  $\chi^2$  measure tends to be inflated due to sample size, we additionally compared the other goodness-of-fit indices, which all suggested a better fit to the data of the parent models compared with those of the nested models (see Tables 6 and 8).

In sum, the results of the nested models comparison procedure has offered additional support for the discriminant value of the PHS against the ADHS, Agency, and Pathways.

#### Step 4: Convergent Validity of the PHS and Comparison With the ADHS

The objectives of Step 4 are twofold: First, to evaluate the convergent validity of the PHS using well-known concepts to which hope usually relates, either positively or negatively and second, to find similarities and differences to the correlations with the ADHS.

**Data Analysis.** Using the Swiss sample 4 ( $n = 6,379$ ), we calculated correlations of the PHS and the ADHS with related constructs and compared these results to assess

which scale corresponds more strongly to which theoretical concept of hope.

For this purpose, we used the correlation comparison analysis procedure of Fisher, calculating the  $z$  values to evaluate the significance of the difference between two correlation coefficients. We started with an evaluation of the accuracy of the new sample. Afterward, we calculated Cronbach-alpha reliabilities for all scales.

**Results.** The new Sample 4 achieved a very good KMO measure of .95. The first information displayed in Table 9 is the reliability Cronbach alpha values, the mean values and the standard deviations for all constructs. The PHS achieved a good reliability level ( $\alpha = .88$ ). The lowest alpha coefficient was that of Gratitude ( $\alpha = .76$ ).

Looking at the correlations in Table 9, with all values being significant at  $p < .01$ , the following striking findings became evident: The highest correlation can be detected between Dispositional Hope and Self-Efficacy ( $r = .74$ ), significantly higher than the correlation between Self-Efficacy and Perceived Hope ( $r = .49$ ). Perceived Hope exhibits a significantly lower correlation with Resilience than the ADHS. Although on a lower level, Spiritual Beliefs and Religious Faith revealed significantly higher correlations with the PHS ( $r = .24$  and  $r = .21$ , respectively) than with the ADHS ( $r = .13$  and  $r = .07$ , respectively). Gratitude correlated more strongly with the PHS ( $r = .51$ ) than with

**Table 10.** Results of Hierarchical Regression Analyses With Life Satisfaction and Happiness.

Steps	Predictors	Satisfaction with Life ( $M = 5.04$ ; $SD = 1.25$ )				Subjective Happiness ( $M = 4.98$ ; $SD = 1.30$ )			
		$R^2$	$\Delta R^2$	$\Delta F$	$p$	$R^2$	$\Delta R^2$	$\Delta F$	$p$
Regression analysis 1									
Step 1	PHS	.360	.360	3588.84	.000	.393	.393	4133.19	.000
Step 2	ADHS	.442	.082	932.84	.000	.457	.064	754.90	.000
Regression analysis 2									
Step 1	ADHS	.342	.342	3315.49	.000	.330	.330	3144.86	.000
Step 2	PHS	.442	.100	1138.96	.000	.457	.127	1495.06	.000

Note. PHS = Perceived Hope Scale; ADHS = Adult Dispositional Hope Scale.

the ADHS ( $r = .42$ ). Generativity showed a slightly higher (but not significant) correlation with the PHS ( $r = .33$ ) than with the ADHS ( $r = .30$ ). Although on a lower level too, Helping Others displays a significantly higher correlation with the PHS ( $r = .22$ ) than with the ADHS ( $r = .15$ ). With regard to Depression/Anxiety, the PHS revealed a strong negative correlation ( $r = -.51$ ), which is slightly, but significantly, higher than the correlation of Depression/Anxiety with the ADHS ( $r = -.47$ ).

### Step 5: Predictive and Incremental Utility

Step 5 is dedicated to assess predictive utility and incremental validity of the PHS with respect to the ADHS by means of hierarchical regression analyses.

**Data Analysis.** Using the same Swiss sample 4, a series of hierarchical regression analyses were conducted using three dependent variables: SLS, SHS and one item describing the expectations one has about his or her private life for the forthcoming year. When defining SLS and SHS as dependent variables, two hierarchical regression analyses were performed, entering the PHS and the ADHS into the regression equation alternatively in Steps 1 and 2. Using the one item concerning one's outlook on one's private life for the coming year as a dependent variable, the SLS and the SHS were entered in Step 1 as control variables. Afterward, the PHS and the ADHS were forced alternatively in Steps 2 and 3. The discriminant utility of the PHS would emerge if it accounted for additional variance beyond that accounted for by the ADHS.

**Results.** The five Life Satisfaction items revealed a Cronbach  $\alpha = .89$  ( $M = 5.04$ ;  $SD = 1.25$ ) and the four Happiness Items of  $\alpha = .81$  ( $M = 4.98$ ;  $SD = 1.31$ ). The PHS correlated moderately with the SWS ( $r = .60$ ) and with the SHS ( $r = .63$ ), with slightly higher scores than the ADHS ( $r = .58$  with the SWS and  $r = .57$  with the SHS). In the regression analysis, the PHS turned out to be the stronger predictor of both the SWS ( $\beta = .391$ ,  $p < .001$ ) and the SHS ( $\beta = .442$ ,  $p < .001$ ), compared with the ADHS ( $\beta = .354$  and

$\beta = .314$ , respectively,  $p < .001$ ). Table 10 exhibits the model summaries of the regression analyses. In the first analysis, using Satisfaction with Life as dependent variable, the PHS entered in Step 1 contributed 36% of the variance, and the ADHS further increased the prediction by 8.2% in Step 2. In the second analysis, when the ADHS was forced in Step 1, it contributed to explain 34.2% of variance, and the PHS predicted additional 10% in Step 2. These results suggest that the PHS contributes uniquely to the prediction of Satisfaction in Life that was not explained by the ADHS.

Using Subjective Happiness as dependent variable, when the PHS was entered in Step 1 it contributed to explain 39.3% of variance. A further increase of the prediction by  $\Delta R^2 = 6.4\%$  was achieved when including the ADHS in Step 2. When forcing the ADHS in Step 1, 33% of variance was explained. In Step 2, the PHS contributed additionally with  $\Delta R^2 = 12.7\%$ . Again, the PHS accounted for unique predictive variance with regard to Subjective Happiness that could not be explained by the ADHS.

Finally, we performed an additional hierarchical regression analysis defining one's outlook on one's private life for the coming year as dependent variable ( $M = 3.81$ ;  $SD = 1.03$ ; Pearson correlations significant at  $p < .01$ , scoring  $r = .47$  with the PHS and  $r = .37$  with the ADHS) and entered the SWS and the SHS as control variables. As shown in Table 11, the PHS turned out to be the strongest predictor ( $\beta = .273$ ,  $p < .001$ ), followed by the SWS ( $\beta = .191$ ,  $p < .001$ ), the SHS ( $\beta = .099$ ,  $p < .001$ ) and the ADHS ( $\beta = .037$ ,  $p = .011$ ). In the first analysis, the SWS and the SHS entered in Step 1, contributed 22.4% of the variance, the PHS further increased the prediction by 4.5% in Step 2, and in Step 3, the ADHS caused a further increment by 0.1%. In the second analysis, when the ADHS was forced in Step 2, the increase in  $R^2$  was 0.8%, but then, in Step 3, the PHS contributed an additional 3.8% of variance. These results suggest that the PHS contributes uniquely to the prediction of the outlook one has on one's private life for the coming year that was not explained by the SWS and the SHS, and that its predictive capacity is stronger than that of the ADHS.



**Table 11.** Results of Hierarchical Regression Analyses With Outlook in Private Life for 2016.

Steps	Predictors	$\beta$	$p$	$R^2$	$\Delta R^2$	$\Delta F$	$p$
Regression analysis 1							
Step 1	SWS	.191	.000				
	SHS	.099	.000	.224	.224	920.32	.000
Step 2	PHS	.273	.000	.269	.045	395.25	.000
Step 3	ADHS	.037	.011	.270	.001	6.48	.011
Regression analysis 2							
Step 1	SWS	.191	.000				
	SHS	.099	.000	.224	.224	920.32	.000
Step 2	ADHS	.037	.011	.232	.008	67.17	.000
Step 3	PHS	.273	.000	.270	.038	331.43	.000

Note. SWS = Satisfaction with Life Scale; SHS = Subjective Happiness Scale; PHS = Perceived Hope Scale; ADHS = Adult Dispositional Hope Scale.

## General Discussion

The particular objective of this article was to elaborate and validate a measure of hope to directly assess the level of hope as perceived by the respondents. Furthermore, reverting to theoretical questions emerging from many different definitions of hope, we wanted to evaluate the commonalities and differences between hope, as perceived by ordinary people, and the concept of Dispositional Trait Hope. Many authors have pleaded for the need to ask people directly about their feelings of hope and the necessity of developing robust measures for this purpose (Averill et al., 1990; Bruininks & Male, 2005; Farran et al., 1995; Tong et al., 2010). Furthermore, there has been a call for a clearer distinction between hope and other psychological constructs such as Self-efficacy (Rand & Cheavens, 2009; Scioli et al., 1997).

Starting from the four items of the hope and optimism WHOQOL-SRPB subscale, we adapted and further elaborated a short six-item measure of hope, that we called the PHS. Using exploratory and confirmatory factor analysis to assess the dimensionality, reliability, and validity of the measure, we are able to report that PHS has revealed good psychometric properties. Compared with the Adult Dispositional Trait Hope Scale, we could demonstrate the convergent, as well as the discriminant nature of the PHS. The analyzed items belonging to the PHS and the ADHS, although they significantly correlate with each other, are not directly representative of one common and homogeneous phenomenon that could be conceptualized as general hope. On the contrary, it is of particular interest that the PHS items, which intend to measure hope as perceived by individuals, seem either to measure a distinct aspect of hope or even a distinct basic experience compared with the ADHS and the Agency and Pathways indicators. Our studies support the arguments of authors who maintain that the Dispositional Trait Hope Scale measures something different, or at least,

merely an isolated dimension of what ordinary people understand under hope (Bruininks & Malle, 2005; Scioli et al., 1997; Tennen et al., 2002; Tong et al., 2010). Nevertheless, taken on its own, every single factor under scrutiny has a high internal consistency, and thus serves to measure a certain part of reality.

Concerning convergent validity, significant correlations between the PHS and all other constructs were achieved. Compared with the ADHS, the PHS showed a lower (but still strong) positive correlation to Self-Efficacy and Resilience, but a higher positive correlation with Spiritual Beliefs and Religious Faith, together with altruistic motives such as Helping Others and Generativity, supporting the broader conceptualizations of hope proposed by several authors, including transcendent, altruistic, and spiritual elements (Averill et al., 1990; Farran et al., 1995; Dufault & Martocchio, 1985; Peterson & Seligman, 2004; Scioli, 2007; Scioli et al., 2011). The significantly lower correlation of the PHS with Resilience compared with the ADHS, gives support to the argument that hope comes especially into play in situations where people feel unable to cope by means of their own resources alone (Fredrickson, 2013; Pruyser, 1986).

Particularly important for the value of a new scale is to examine its predictive utility for accounting unique variance in comparison with related outcome measures. The PHS has revealed to contribute with unique predictive variance vis-à-vis the ADHS in relation to Satisfaction with Life, Subjective Happiness, and to the subjective assessment of the middle term (next year) prospect in one's life (more or less optimistic or pessimistic).

In general terms, the following findings can basically be drawn from this study: The PHS is broader in scope since the ADHS is strongly focused on the self-centered dimension of self-efficacy, and the PHS relates (although on a lower level) more intensely to self-transcendent, spiritual, and religious elements of hope than the ADHS. These findings support past criticisms to the ADHS, showing that hope, as perceived by people, is something distinct or broader than what the ADHS intends to measure (Bruininks & Malle, 2005; Tennen et al., 2002; Tong et al., 2010). However, Perceived Hope still relates much more strongly to self-efficacy than to the spiritual, altruistic, and religious dimensions, at least among the German-speaking population, supporting the importance of the cognitive and goal-oriented dimension of hope. The PHS adds to the ADHS, since its predictive utility with regard to Life Satisfaction and Happiness could be demonstrated.

## Limitations

The first limitation of our study is that the PHS does not address the question regarding the nature of hope and the

different dimensions it may have. In future studies, the PHS could be used as a construct to which multidimensional measures of hope can be related. Furthermore, the validation of the PHS was examined only in German-speaking samples. Future research must still evaluate if the PHS could be used in different cultural and religious contexts. One further limitation is that, although our study is based on large and heterogeneous samples of participants, these samples are not strictly representative of the German and the German-speaking Swiss population, but they are rather focused on people with Internet literacy and access. However, web-based research possesses clear advantages, since the size and composition of the samples are better than other convenience samples often obtained by researchers. Until now, we are not aware of any hope scale that would have been validated using a representative sample of a country's population. The samples used to initially validate the mostly used hope scales are of limited number  $n < 1,000$  (e.g., Hope Index Scale,  $n = 486$  [Obayuwana et al., 1982]; Miller Hope Scale,  $n = 522$  [Miller & Powers, 1988]; Nowotny Hope Scale,  $n = 302$  [Nowotny, 1989]; Herth Hope Scale,  $n = 120$  [Herth, 1991]; Comprehensive Trait Hope Scale,  $n = 80$  college students [Scioli et al., 2011]). The Adult Dispositional Hope Scale was initially validated with 6 samples of college students ranging from  $n = 339$  to  $n = 955$  and 2 samples of adults in psychological treatment ( $n = 97$  and  $n = 109$ ; Snyder et al., 1991). Even though we do not claim to have strictly representative results for the German and the German-speaking Swiss population, we maintain that the results are general and well balanced enough, since the obtained samples contain a large and very heterogeneous number of people, providing a similar structure across samples in terms of gender, age, education level, and family status.

## Conclusions

With the PHS, we intend to contribute to close a research gap, providing a brief instrument with good psychometric properties that permits researchers to assess the phenomenon of hope without using predetermined concepts on how people may define hope. In this way, we avoid the risk of item overlap and confounding with other constructs, such as self-efficacy or spirituality. The PHS permits us to address hope in a broader sense than the Dispositional Trait Hope Scale, which focuses mainly on the cognitive dimension of hope. Because of its brevity, the PHS can easily be used in the analysis of mediator and moderator effects and correlations in the context of larger studies, but also as an instrument for a quick check on therapeutic and counseling settings.

## Appendix

### Perceived Hope Scale

*English Version.* How do the following statements apply to you personally?

Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
0	1	2	3	4	5

1. In my life hope outweighs anxiety.
2. My hopes are usually fulfilled.
3. I feel hopeful.
4. Hope improves the quality of my life.
5. I am hopeful with regard to my life.
6. Even in difficult times I am able to remain hopeful.

*German Version.* In welchem Ausmass treffen folgende Aussagen auf Sie persönlich zu?

Stimmt gar nicht	Stimmt weitgehend nicht	Stimmt eher nicht	Stimmt ein wenig	Stimmt ziemlich	Stimmt voll und ganz
0	1	2	3	4	5

1. In meinem Leben überwiegen eher die Hoffnungen als die Ängste.
2. Meine Hoffnungen gehen meistens in Erfüllung.
3. Ich fühle mich hoffnungsvoll.
4. Hoffnung verbessert meine Lebensqualität.
5. Ich bin hoffnungsvoll in Bezug auf mein Leben.
6. Ich kann auch in schwierigen Zeiten hoffnungsvoll bleiben.

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