The Journal of Positive Psychology, 2014
http://dx.doi.org/10.1080/17439760.2014.936964

Routledge
Taylor & Francis Group

The structure of the State Hope Scale

Charles Martin-Krumm[a,b]*, Yann Delas[c], Marc-André Lafrenière[d], Fabien Fenouillet[e] and Shane J. Lopez[f]

[a]*CREAD EA 3875, ESPE de Bretagne, école interne UBO, Rennes, France;* [b]*IFEPSA – Les Ponts de Cé, France;* [c]*CREAD EA 3875, University Rennes 2, Rennes, France;* [d]*Psychology, University of Maryland, College Park, MD, USA;* [e]*Laboratoire Cognitions Humaine et Artificielle (Chart) EA 4004, Université Paris Ouest Nanterre La Défense, Paris, France;* [f]*The Clifton Strengths Institute, 1001 Gallup Drive, Omaha NE 68102, USA*

(*Received 5 December 2013; accepted 23 May 2014*)

The present research aimed to examine the factorial structure of the State Hope Scale (SHS). In Study 1, using confirmatory factorial analyses, two factorial structures were contrasted: a single-factor mode (representing a general hope construct) and a second-order factor model (with general hope characterized by agency and pathways). Results revealed that the two-factor model was more likely to be replicated. Furthermore, invariance analyses revealed that the two-factor structure applied equally across age groups and gender. In Study 2, the factorial structure of the SHS was evaluated again. Once more, results confirmed the superiority of the two-factor model. In addition, hope was positively linked to mental health.

Keywords: State Hope; agency; pathways; models; education

Most theories of hope converged on describing hope as a positive expectation to a desired goal (Tong, Fredrickson, Chang, & Lim, 2010). For Stotland (1969), hope was apprehended as a cognitive concept referring to expectations about goal attainment. An important psychological theory on the topic was developed by Snyder (2002, for a review). In Snyder's model, hope is conceptualized around three main components: goals, pathways, and agency (Snyder, 2002). As such, the concept is defined as 'the process of thinking about one's goals, along with the motivation to move toward those goals (agency), and the ways to achieve those goals (pathways)' (Snyder, 1995, p. 355). The construct of hope is thus central to successful goal attainment (Snyder et al., 1991) and goals are the engine for hope (Snyder, 1994a, 1994b). They provide the mental target to achieve. In addition, goals must be realistic and present an optimal level of challenge to generate enough motivation (Snyder, 2002). Goals that are too difficult can lead to resignation or premature goal abandonment. Goals that are too easy, on the other hand, do not constitute a sufficient challenge to generate hopeful thinking.

Pathways refer to the ability to identify strategies or ways to achieve desired goals (Snyder, Sympson, Michael, & Cheavens, 2000). For Snyder (2002), people get closer to their goals by thinking about viable solutions (i.e. pathways) to achieve them. Consequently, high levels of hope should lead to an active search for plausible means to achieve goals. Similarly, people with high levels of hope are more competent in finding alternative ways to achieve a specific goal (Snyder, LaPointe, Crowson, & Early, 1998). As a result, hope should be beneficial to goal attainment, especially when impediments are encountered (Snyder et al., 1991). On the other hand, pathways thinking should be more tenuous for hopeless people (Snyder, 2002). Consequently, these individuals should be less likely to find alternate routes to reach their goals.

The agency dimension is the motivational component of Snyder's hope theory and describes the propensity to develop and sustain necessary motivation to achieve one's goals. Specifically, it refers to the energy and perseverance someone is willing to expand in order to reach a goal. Agency thinking is particularly crucial when individuals encounter obstacles (Snyder, 2002). Although agency and pathways components are strongly related, they are not exchangeable or synonymous (Snyder et al., 1991). In fact, both components are necessary for adequate hopeful thinking.

Hope has some resemblance with other positive psychology theories such as self-efficacy (Bandura, 1977) and optimism (Scheier & Carver, 1985) theories. Nevertheless, despite some similarities, only the Snyder's hope model takes into account both agency and pathways dimensions. For instance, optimism (Scheier & Carver, 1985) as well as self-efficacy (Bandura, 1977) theories are mainly focused on expectancies for success, overlooking pathways thinking. In other words, hope also takes into account thoughts related to what individuals can do to achieve their goals. In contrast, optimism is

*Corresponding author. Email: charles.martin-krumm@wanadoo.fr

mainly focused on expectancies for future outcomes (Rand, 2009). Furthermore, self-efficacy theory focuses on beliefs about own capacities to achieve desired goals, which are closest to the agency dimension of hope. Finally, self-efficacy is centered on individuals' perceptions of their ability to achieve their goals, whereas hope focuses principally on the resolve in goal attainment.

Initially, hope was conceptualized as a stable personality disposition. Consequently, a scale assessing hope at the dispositional level was developed and validated (Dispositional Hope Scale (DHS); Snyder et al., 1991). Nevertheless, hope can also be represented as a temporary state related to particular events or specific moments (i.e. state level). In order to assess hope situationally, the State Hope Scale was created and validated (SHS; Snyder et al., 1996). Without identifying specific goals, the SHS measures a person's momentary hopeful thinking (Snyder, Feldman, Shorey, & Rand, 2002). Snyder and colleagues (1996) showed the SHS and DHS were positively correlated, reflecting the fact that people with high dispositional hope generally report higher state hope levels.

The SHS has been positively associated with several variables such as state self-esteem, positive affect (Snyder et al., 1996), self-efficacy (Davidson, Feldman, & Margalit, 2012), and negatively correlated with negative emotions (Snyder et al., 1996) and burnout (Gustafsson, Hassmén, & Podlog, 2010). In addition, Irving and colleagues (2004) showed that state hope is associated with higher levels of well-being, fewer symptoms of depression, and increased coping abilities. With respect to performance, state hope has been positively associated with performance in complex verbal learning tasks (Snyder et al., 1996), anagram performance (Peterson, Gerhardt, & Rode, 2006), track and field performances (Curry, Snyder, Cook, Ruby, & Rehm, 1997), and academic achievement (Davidson et al., 2012; Rolo & Gould, 2007).

Present research

It is important to note that most studies employing Snyder's hope theory measured hope at the dispositional level (Alarcon, Bowling, & Khazon, 2013). Furthermore, in these studies, there was no consensus between using the global hope score or separate agency and pathways scores. Accordingly, in some studies, a single hope score was computed by averaging means of the pathways and agency subscales (e.g. Brouwer, Meijer, Weekers, & Baneke, 2008; Lopez & Calderon, 2011; Snyder et al., 1997), whereas in others the two hope dimensions were examined separately (e.g. Arnau, Rosen, Finch, Rhudy, & Fortunato, 2007; Bailey, Eng, Frisch, & Snyder, 2007; Ciarrochi, Heaven, & Davies, 2007). Additionally, there are some evidence that agency may be the more influential component of hope (Feldman, Rand, & Kahle-Wrobleski, 2009). For instance, Arnau and colleagues (2007) found the agency component of hope to be negatively related to depression and anxiety, whereas the pathways dimension was unrelated to outcomes. Overall, both measurement models have been utilized with the DHS and no empirical evidence advocated one over the other method (Brouwer et al., 2008; Roesch & Vaughn, 2006).

The same measurement issue applies to the SHS. In fact, in most previous research, only the global SHS score was taken into account (Curry et al., 1997; Davidson et al., 2012; Ong, Edwards, & Bergeman, 2006; Peterson et al., 2006; Rego, Sousa, Marques, & Pina e Cunha, 2012; Snyder et al., 2005). In the few studies that have examined both components separately, again, the agency dimension was found to be the more influential component of hope. For instance, agency (but not pathways) was significantly related to outcomes, such as life meaning, self-esteem, depression, anxiety, and burnout (Cheavens, Feldman, Gum, Michael, & Snyder, 2006; Gustafsson et al., 2010). Similarly, Gustafsson and colleagues (2010) demonstrated that only agency thinking was a significant predictor of burnout dimensions. Interestingly, Irving and colleagues (2004) found that agency and pathways predicted therapeutic improvement in early and later therapy sessions, respectively. Finally, in contradiction with past research, Klausner and colleagues (1998) have found that only pathways predicted reduced symptoms of anxiety and depression. Overall, the distinction between agency and pathways seems to be important both theoretically and empirically. Nevertheless, research employing the SHS is not consensual concerning the structure of hope. Is hope better conceptualized as an one-dimensional construct (i.e. with a single global score of SHS) or as composed of two dimensions, agency and pathways components, representing together a general hope construct? Moreover, there are no theoretical recommendations for using either one- or two-factor model for the SHS. Additionally, no study has directly compared the one- and two-component hope model in the prediction of dependents variables.

The goal of the present research was to investigate the above issue. Consequently, we tested these two competing models in two studies (see Figures 1 and 2). To begin, in Study 1, the one- and two-factor models of the SHS were compared. Moreover, invariance across age and gender of the superior factorial structure were investigated. The aim of the second study was to re-examine the factorial structure of the SHS. Furthermore, both state hope models were contrasted in the prediction of mental health.

Study 1

The general objective of the present study was threefold. First, the psychometric properties of a French version of

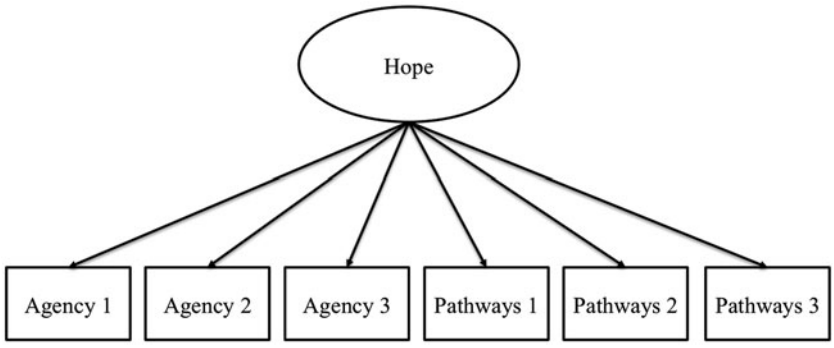

Figure 1. Single-factor model representing a general hope construct.

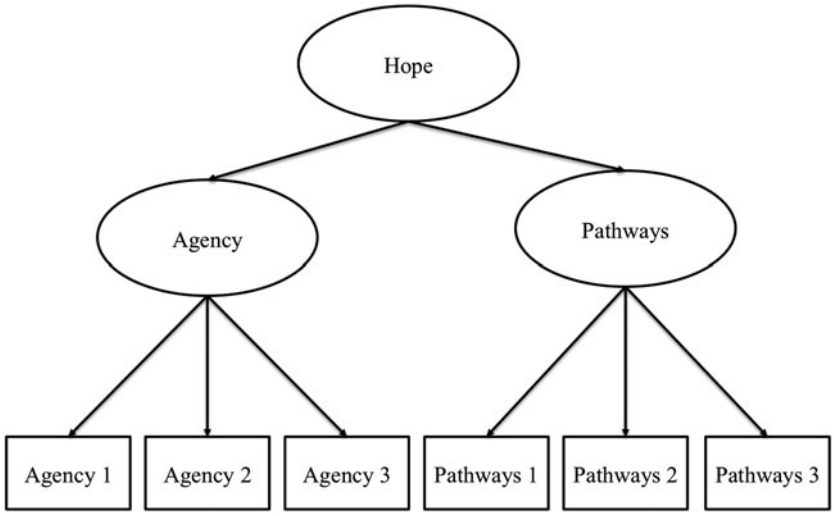

Figure 2. Two-factor model with general hope defined by agency and pathways.

the SHS were confirmed. Second, and more importantly, two competing hope factorial structures were examined, using confirmatory factor analyses (CFA), in a first subsample. Finally, in a second subsample, invariance across age and gender was tested on the superior factorial structure.

Method

Participants

Participants were 940 secondary education pupils aged between 10 and 23 years old ($M_{age} = 15.67$, $SD_{age} = 2.62$). The sample consisted of Caucasian individuals and the majority were female (627 girls and 313 boys).

Procedure and measures

The SHS (Snyder et al., 1996) consists of six items, three per dimension. The content of the three agency items taps the sense of successful determination in relation to personal goals. The three pathways items pertain to people's cognitive appraisals of their ability to generate means for surmounting goal-related obstacles and reaching goals.

The SHS was translated and back-translated for use in the French language (Brislin, 1970). Two bilingual English–French speakers were solicited for the back-translation procedure. Afterward, a translator verified the clarity of the French items and the conformity of the French version with the English scale. A pilot study was then conducted to validate item clarity. For that purpose, 10 students were interviewed. Results revealed that the translation for the answer *I do not agree at all* vs. *I totally agree* was more appropriate in French than *definitively false* vs. *definitively true*. The final experimental version of the scale was composed of two three-item subscales. Items were reported on a six-point Likert scale ranging from *1 = I do not agree at all to 6 = I totally agree*.

Finally, participants were recruited during physical education lessons. They all agreed to participate in the study which was presented as dealing with motivation at

school. Parental and school administrator permissions were requested before starting the investigation. Participants completed demographic questions and the French version of the SHS.

Data analysis

The analytical strategy was twofold. We first investigated the factorial structure of the SHS. Afterward, in another sample, we evaluated how well this factorial structure generalizes across age groups and gender. To do so, we randomly divided the sample into two groups of participants. Furthermore, age was dichotomized to test measurement invariance (i.e. under 17 years old and above 18 years old).

We initially sought to determine the best-fitting factorial structure of the SHS. Consequently, two competing models were tested. This procedure was based on a model comparison strategy (MacCallum, 1995) in which a number of alternative a priori models are fitted to the same data-set. The first model (single-factor) hypothesized a single-factor structure representing a general hope construct, as hypothesized by Brouwer and colleagues (2008). The second model (second-order) was a second-order model with general hope characterized by two latent constructs, namely agency and pathways, in accordance with previous studies (e.g. Creamer et al., 2009; Roesch & Vaughn, 2006; Snyder et al., 1996). To test these two models, CFA were employed. Furthermore, we assessed the reliability of the French version of the SHS.

Afterward, we tested the measurement invariance of the SHS across age groups and gender. In order to do so, we tested increasingly stringent models (see Marsh, 1994). Consequently, we first tested configural invariance, whether the same configuration holds across groups. We then tested weak invariance, by constraining pattern coefficients between each item and its underlying construct to be equal across groups, and strong invariance, by additionally constraining item intercepts to be also equal across groups. We furthermore tested strict invariance, by constraining item residuals across groups. When testing measurement invariance, Cheung and Rensvold (2002) suggested comparing the comparative fit index (CFI) statistics of baseline model with constrained models. Furthermore, it is suggested that a decline in CFI smaller than or equal to −0.01 indicates that the null hypothesis of invariance should not be rejected (Cheung & Rensvold, 2002). Following recommendations and typical practice with single-group models, as well as studies based on multiple groups, we apply the guidelines for model comparisons based on CFI to the Tucker-Lewis index (TLI). An advantage of the TLI is that it incorporates a control for parsimony, whereas the change in CFI does not, making TLI particularly relevant to model comparisons (see Marsh et al., 2013).

All structural equation modeling analyses in the present study were performed using AMOS with maximum likelihood estimation. We used several indices to assess the model fit (Hu & Bentler, 1999). First, fit of the model to the data was examined using the chi-square test. A non-significant chi-square indicates that the model was able to replicate suitably the sample covariance matrix. However, there are problems with relying solely on chi-square test because this statistic is sensitive to the size of the correlations and to sample size (see Kline, 2010). Consequently, we used additional well-established fit indices to further assess model fit: one index of absolute fit, standardized root mean square residual (SRMR); two indices of comparative fit, the CFI and the TLI; and a parsimony corrected fit index, the root mean square error of approximation (RMSEA). We used the recommended two index strategies to assess fit, with values greater than 0.95 for CFI and TLI (Bentler, 1990; Hu & Bentler, 1999), and SRMR and RMSEA values less than 0.08, which suggest adequate fit (Browne & Cudeck, 1989; Hu & Bentler, 1999). Finally, in order to contrast different models, the Akaike's Information Criterion (AIC) was computed. Within a set of competing non-hierarchical models, the one with the lowest AIC value should be preferred (Kline, 2010).

Results

Preliminary analyses

Inspection of the skewness and kurtosis indices for all variables proved to be normal (values ranged from −0.739 to −0.361 for skewness and from −0.699 to −0.243 for kurtosis). Data screening revealed no value higher than three standard deviations from the mean. Additionally, in order to screen for multivariate outliers, we computed Mahalanobis distance values for all participants. No participant exceeded the critical chi-square value at the $p = 0.001$ level with Bonferonni correction (29.32).

Factorial structure

The first sample consisted of 513 secondary education pupils (338 females, 175 males; $M_{age} = 15.44$, $SD_{age} = 2.79$). We display means, standard deviations, and factor loadings for all SHS items in Table 1. Furthermore, model statistics are displayed in Table 2. The first model (one-factor) did fit the data adequately. Moreover, the second model (second-order) fitted the data comparably well. However, the second model had slightly lower AIC value ($\Delta AIC = -0.54$), suggesting that the second model is more likely to be replicated. All factor loadings specified were significant (see Table 1). Consequently, the second-order model was judged the most acceptable

Table 1. Descriptive statistics and factor loadings for the State Hope Scale (Study 1, Sample 1) ($N = 513$).

Items	*M*	SD	Factor loadings	
			Agency	Pathways
Agency items				
1. À l'heure actuelle, je poursuis mes objectifs avec énergie/volonté.	4.36	1.39	0.795	–
2. En ce moment, je me vois en train de réussir ma vie.	4.19	1.49	0.473	–
3. En ce moment précis, je suis en train d'atteindre les buts que je m'étais fixé.	4.05	1.49	0.822	–
Pathways items				
4. En ce moment, lorsque je suis en difficulté, je suis capable de trouver différentes manières de m'en sortir.	4.36	1.34	–	0.769
5. Il y a de nombreuses solutions concernant le problème auquel je suis confronté(e) en ce moment.	3.89	1.52	–	0.669
6. Actuellement, je peux trouver différentes manières d'atteindre mes objectifs.	4.30	1.34	–	0.789

Table 2. Fit statistics for the factorial structure of the State Hope Scale (Study 1, Sample 1).

Model	χ^2	d*f*	χ^2/d*f*	SRMR	CFI	TLI	RMSEA	AIC
Single-factor	23.66	9	2.63	0.02	0.99	0.98	0.06 (0.03–0.09)	47.66
Second-order	21.12	8	2.64	0.02	0.99	0.98	0.06 (0.03–0.09)	47.12

Notes: Single-factor: One-factor model; Second-order: Pathways and agency represented by distinct first-order factors derived from a second-order factor (i.e. hope).
$N = 513$.

model and was thus our baseline model in invariance analyses.

Results revealed adequate reliability indices for the pathways subscale ($\alpha = 0.72$), agency subscale ($\alpha = 0.78$), and overall scale ($\alpha = 0.86$). These findings are close to those obtained by Snyder et al. (1996) and above Nunnally's (1978) criterion. Another question related to the issue of internal reliability involves the correlation between the pathways and agency scores. Although pathways and agency are theorized to be separately identifiable, they should be strongly related in the line with Snyder's hope model. Results revealed that both subscales are indeed highly and positively correlated ($r = 0.74$, $p < 0.001$).

Invariance analyses

The second sample consisted of 427 secondary education (289 females, 138 males; $M_{age} = 15.95$, $SD_{age} = 2.43$). Three hundred and twenty-two participants were between 13 and 17 years old and 105 were over 18 years old. Model statistics are presented in Table 3.

Age invariance

Results provided reasonable support for configural invariance. We then tested whether the factor loadings are the same across age groups. Fit indices revealed reasonable fit to the data ($\Delta TLI = 0.005$). Subsequently, age differences in item intercepts were additionally investigated. Results revealed adequate fit indices ($\Delta TLI = 0.010$), suggesting consistent item functioning. Finally, item uniqueness (i.e. residuals) was as well assessed. Fit indices revealed acceptable fit to the data ($\Delta TLI = 0.008$), permitting the comparison of manifest (i.e. unweighted) subscale scores. Overall, results confirmed strict invariance of the French version of the SHS across age groups.

Gender invariance

Results provided reasonable support for configural invariance. We then tested whether the factor loadings are the same across gender. Fit indices revealed reasonable fit to the data ($\Delta TLI = 0.008$). Subsequently, gender differences in item intercepts were additionally investigated. Results revealed substantially poorer fit indices ($\Delta TLI = 0.032$), implying differential item functioning. Overall, results revealed that the factorial structure and factor loadings are equivalent across gender. However, lack of strong invariance suggested that unweighted mean differences across genders should be treated with caution.

Discussion

The general objective of the present study was threefold. First, the psychometric properties of the French version

Table 3. Multiple group tests of measurements invariance over age groups and gender (Study 1, Sample 2).

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA	Constrained parameters
Age invariance							
Configural invariance	30.35	16	1.90	0.988	0.977	0.046 (0.020–0.071)	None
Weak invariance	33.97	20	1.70	0.988	0.982	0.041 (0.014–0.064)	Factor loadings
Strong invariance	39.59	26	1.52	0.988	0.987	0.035 (0.007–0.056)	Factor loadings and item intercepts
Strict invariance	50.25	32	1.57	0.984	0.985	0.037 (0.015–0.056)	Factor loadings, item intercepts, and residuals
Gender invariance							
Configural invariance	36.90	16	2.31	0.981	0.964	0.056 (0.032–0.08)	None
Weak invariance	39.95	20	2.00	0.982	0.972	0.049 (0.026–0.071)	Factor loadings
Strong invariance	90.37	26	3.48	0.941	0.932	0.077 (0.060–0.095)	Factor loadings and item intercepts
Strict invariance	115.31	32	3.48	0.923	0.928	0.079 (0.064–0.095)	Factor loadings, item intercepts, and residuals

$N = 427$.

of the scale were first insured. Overall, results revealed adequate properties of the French version of the SHS. Second, and more importantly, two factorial structures of the SHS were contrasted. The first model was composed of a single general hope variable, whereas the second model comprised two latent variables, namely agency and pathways, forming together a second-order latent construct representing general hope. Results revealed that the second model was slightly more likely to be replicated, in accordance with the dual perspective of hope (Ong et al., 2006; Peterson et al., 2006; Snyder et al., 2005). Finally, invariance analyses revealed that the two-factor structure applied equally across age groups and gender.

Study 2

The aim of Study 2 was to re-examine the factorial structure of the SHS. Likewise to Study 1, two factorial structures were contrasted: a single factor (representing a general hope construct) and a second-order factor (with general hope characterized by agency and pathways). Furthermore, given that no study has compared the one- and two-component hope models in the prediction of dependents variables, an additional objective of Study 2 was to compare both state hope factorial structures in the prediction of outcomes. Mental health was selected as a correlate of choice given that past research revealed a strong association between hope and mental health (e.g. Cheavens et al., 2006; Gallagher & Lopez, 2009; Gilman, Dooley, & Florell, 2006; Marques, Pais-Ribeiro, & Lopez, 2011; Snyder et al., 1991).

Method

Participants

Participants were 665 secondary education pupils aged between 10 and 23 years old ($M_{age} = 14.93$, $SD_{age} = 2.66$). The sample consisted of Caucasian individuals and the majority were female (417 girls and 248 boys).

Procedure and measures

Participants were recruited during physical education lessons. They all agreed to participate in the study which was presented as dealing with motivation at school. Parental and school administrator permissions were requested before starting the investigation. Participants completed demographic questions and the French version of the SHS. Results revealed adequate reliability indices for the pathways subscale ($\alpha = 0.71$), agency subscale ($\alpha = 0.77$), and overall scale ($\alpha = 0.71$). Moreover, pupils' mental health was assessed using the Mental Health Inventory-5 (MHI-5; Ware, Snow, Kosinski, & Gandek, 1993). The MHI-5 consists of five items assessing levels of anxiety, depression, emotional and behavioral troubles, as well as well-being (sample item: 'During the past month, how much of the time were you a happy person?'). Items are reported on a six-point Likert scale ranging from *1 = Never to 6 = Always*. Results revealed good internal consistency ($\alpha = 0.81$) and factorial validity ($\chi^2 = 4.53$, $p = 0.21$; d$f = 3$; SRMR = 0.01; CFI = 0.99; TLI = 0.99; RMSEA = 0.03 (0.00–0.08) after adding two error covariance paths.

Data analysis

All structural equation modeling analyses in the present study were performed using AMOS with maximum likelihood estimation. The same criteria were used to assess goodness of fit as in Study 1. We sought to determine the best fitting model of the SHS in the prediction of mental health. Consequently, two competing models were tested. This procedure was based on a model comparison strategy (MacCallum, 1995) in which a number of alternative a priori models are fitted to the same dataset. The first model (single-factor) hypothesized a single-factor structure representing a general hope construct, as hypothesized by Brouwer and colleagues (2008), predicting mental health. The second model (second-order) was a second-order model with general hope characterized by two latent constructs, namely agency and pathways, in

accordance with previous studies (e.g. Creamer et al., 2009; Roesch & Vaughn, 2006; Snyder et al., 1996), again, predicting mental health. In both models, mental health was a latent variable defined by the five items of the MHI-5. To test these two models, structural equation modeling was employed.

Results

Preliminary analyses

Inspection of the skewness and kurtosis indices for all variables proved to be normal (values ranged from −1.164 to −0.050 for skewness and from −0.785 to 0.797 for kurtosis). Data screening revealed no values higher than three standard deviations from the mean. Additionally, in order to screen for multivariate outliers, we computed Mahalanobis distance values for all participants. Ten participants exceeded the critical chi-square value at the $p = 0.05$ level with Bonferonni correction (37.70). All other statistical analyses presented below were executed on the remaining 655 participants.

Main analyses

Model statistics are displayed in Table 4. The first model (one-factor) did fit the data adequately. Moreover, the second model (second-order) fitted the data comparably well. However, the second model had slightly lower AIC value ($\Delta AIC = -0.85$), suggesting that the second model is more likely to be replicated. All factor loadings specified were significant. Consequently, the second-order model was judged the most acceptable model. Furthermore, hope was positively and significantly related to mental health and that equally in both models ($\beta = 0.26$, $p < 0.001$).

Discussion

The general objective of the present study was to re-examine the factorial structure of the SHS in the prediction of a dependent variable, namely mental health. Two factorial structures of the SHS were contrasted. The first model was composed of a single general hope variable, whereas the second model comprised two latent variables, namely agency and pathways, forming together a second-order latent construct representing general hope. In both models, hope latent construct predicted mental health. Results revealed that the second model was slightly more likely to be replicated, in accordance with the dual perspective of hope (Ong et al., 2006; Peterson et al., 2006; Snyder et al., 2005). Furthermore, in line with past research (e.g. Gallagher & Lopez, 2009; Gilman et al., 2006; Marques et al., 2011; Snyder et al., 1991), hope was positively related to mental health.

General discussion

The present research examined the factorial structure of the SHS. We contrasted two models: an one-dimensional model and a model composed of two dimensions, namely agency thinking and pathways, representing together a general hope construct. We tested these two competing models in two studies. Results revealed that the two-factor model was slightly more likely to be replicated. Furthermore, in Study 1, invariance analyses revealed that the two-factor structure applied equally across age groups and gender. In addition, hope was positively linked to mental health in Study 2. These findings lead to a number of implications.

A first implication is that both models were adequate and statistically valid. In fact, results revealed only a slight advantage of the two-factor model. These findings confirmed previous studies concerning the DHS and SHS, with both the one-factor (Roesch & Vaughn, 2006) and two-factor (Brouwer et al., 2008) models presenting adequate psychometric properties and reliability coefficients. Consequently, the present research provided support for both measurement methods employed in past research (i.e. either single score by averaging all items or two scores representing subcomponents of hope). Nevertheless, the initial question remains: Is hope better conceptualized as an one-dimensional construct or as composed of two dimensions, agency and pathways components, representing together a general hope construct? Despite both models being found to be statically valid, we found that the two-factor model was slightly more likely to be replicated. Furthermore, the two-factor model holds an additional benefit over the single-factor model: It allows

Table 4. Fit statistics for the factorial structure of the State Hope Scale in the prediction of mental health (Study 2).

Model	χ^2	d*f*	χ^2/d*f*	SRMR	CFI	TLI	RMSEA	AIC	Path to mental health
Single-factor	83.17	41	2.17	0.04	0.98	0.98	0.04 (0.03–0.05)	133.17	0.26*
Second-order	78.32	39	2.01	0.04	0.99	0.98	0.04 (0.03–0.05)	132.32	0.26*

Notes: Single-factor: One-factor model; Second-order: Pathways and agency represented by distinct first-order factors derived from a second-order factor (i.e. hope).
$N = 655$.
*$p < 0.05$.

to simultaneously examine the associations between a general hope construct and its subcomponents with outcomes. On the other hand, the single-factor model does not allow the consideration of the unique predictive role of agency thinking and pathways dimensions. Given that past research (e.g. Arnau et al., 2007; Bailey et al., 2007; Ciarrochi et al., 2007) has started unveiling the differential effects of both components, the single-factor model risks overlooking important theoretical subtleties. Overall, given the present empirical evidences supporting the two-factor model and its theoretical advantages, we would recommend the use of the second-factor model over the single-factor one. Consequently, the state hope model, as it was originally formulated (Snyder et al., 1996), should be favored.

Second, results of Study 1 revealed that the two-factor model of the SHS was invariant across age groups and gender. More precisely, results confirmed strict and strong invariance of the SHS across age groups and gender, respectively. These results are consistent with the initial validation of the SHS which found no difference in hope levels according to age and gender (Snyder et al., 1996). Furthermore, tests of measurement invariance over age and gender are interesting from a methodological perspective. Results of Study 1 demonstrated the equivalence of the factorial structure of the SHS across age groups and gender, an often untested and implied psychometric property of most psychological instruments.

Given that no study has compared the one- and two-component hope models in the prediction of dependents variables, Study 2 compared the two models of state hope in the prediction of an important outcome. Mental health was selected as a outcome given its precedents with hope (e.g. Gallagher & Lopez, 2009; Gilman et al., 2006; Marques et al., 2011; Snyder et al., 1991). Results confirmed the slight superiority of the dual perspective of hope (Ong et al., 2006; Peterson et al., 2006; Snyder et al., 2005). Interestingly, in line with past research (e.g. Gallagher & Lopez, 2009; Gilman et al., 2006; Marques et al., 2011; Snyder et al., 1991), hope was positively related to mental health equally in both models. Consequently, the present findings highlighted the potential of hope in fostering psychological health and well-being (Gallagher & Lopez, 2009). Future research is needed in order to replicate the present findings using experimental designs (see Cheavens et al., 2006).

Finally, a collateral contribution of the present research was the development and initial validation of a French version of the SHS. The results of two studies advanced previous hope research by developing a psychometrically sound French version of the SHS. It should be noted that a French version of the DHS (Gana, Daigre, & Ledrich, 2013) has been validated previously. Consequently, adequate tools in French assessing both dispositional and state hope are currently available to facilitate hope research in French-speaking populations.

Limitations

Our findings can be enriched in several ways. First, a drawback of the present study was that participants were uniquely students in PE. Moreover, the factorial structure of the SHS was examined only in French samples. Future research should thus replicate the present results in different domains and cultures. Moreover, within the educational context, an interesting line of inquiry would be to explore the (perhaps dissimilar) role of state hope across subjects. Second, in the present research, the discriminant validity of both hope subscales was not demonstrated. In Study 2, despite testing the one- and two-factor models of the SHS in the prediction of mental health, both subscales were not differently related to outcomes (as demonstrated by adequate model fits). By bearing on the intriguing results of studies concerning the differentiated effect of agency and pathways dimensions (e.g. Cheavens et al., 2006; Gustafsson et al., 2010; Irving et al., 2004; Kennedy, Evans, & Sandhu, 2009; Klausner et al., 1998), future research should try to explore the unique predictive value of both dimensions.

Conclusion

In sum, the findings revealed that both factorial models (i.e. either single- or two-factor) were statistically valid. However, the two-factor model was found to be slightly superior based on both empirical evidences and theoretical arguments. In view of that, the second-factor structure should be favored, as it was originally formulated by Snyder and colleagues (1996).

References

Alarcon, G. M., Bowling, N. A., & Khazon, S. (2013). Great expectations: A meta-analytic examination of optimism and hope. *Personality and Individual Differences, 54*, 821–827. doi:10.1016/j.paid.2012.12.004.

Arnau, R. C., Rosen, D. H., Finch, J. F., Rhudy, J. L., & Fortunato, V. J. (2007). Longitudinal effects of hope on depression and anxiety: A latent variable analysis. *Journal of Personality, 75*, 43–64. doi:10.1111/j.1467-6494.2006.00432.x

Bailey, T. C., Eng, W., Frisch, M. B., & Snyder, C. R. (2007). Hope and optimism as related to life satisfaction. *The Journal of Positive Psychology, 2*, 168–175. doi:10.1080/17439760701409546

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*, 191–215. doi:10.1037/0033-295X.84.2.191

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*, 238–246. doi:10.1037/0033-2909.107.2.238

Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology, 1*, 185–216.

Brouwer, D., Meijer, R. R., Weekers, A. M., & Baneke, J. J. (2008). On the dimensionality of the dispositional hope scale. *Psychological Assessment, 20*, 310–315. doi:10.1037/1040-3590.20.3.310

Browne, M. W., & Cudeck, R. (1989). Single sample cross-validation indices for covariance structures. *Multivariate Behavioral Research, 24*, 445–455.

Cheavens, J. S., Feldman, D. B., Gum, A., Michael, S. T., & Snyder, C. R. (2006). Hope therapy in a community sample: A pilot investigation. *Social Indicators Research, 77*, 61–78. doi:10.1007/s11205-005-5553-0

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 9*, 233–255.

Ciarrochi, J., Heaven, P. C. L., & Davies, F. (2007). The impact of hope, self-esteem, and attributional style on adolescents' school grades and emotional well-being: A longitudinal study. *Journal of Research in Personality, 41*, 1161–1178. doi:10.1016/j.jrp.2007.02.001

Creamer, M., O'Donnell, M. L., Carboon, I., Lewis, V., Densley, K., McFarlane, A., … Bryant, R. A. (2009). Evaluation of the dispositional hope scale in injury survivors. *Journal of Research in Personality, 43*, 613–617. doi:10.1016/j.jrp.2009.03.002

Curry, L. A., Snyder, C. R., Cook, D. L., Ruby, B. C., & Rehm, M. (1997). Role of hope in academic and sport achievement. *Journal of Personality and Social Psychology, 73*, 1257–1267. doi:10.1037/0022-3514.73.6.1257

Davidson, O. B., Feldman, D. B., & Margalit, M. (2012). A focused intervention for 1st-year college students: Promoting hope, sense of coherence, and self-efficacy. *The Journal of Psychology, 146*, 333–352. doi:10.1080/00223980.2011.634862

Feldman, D. B., Rand, K. L., & Kahle-Wrobleski, K. (2009). Hope and goal attainment: Testing a basic prediction of hope theory. *Journal of Social and Clinical Psychology, 28*, 479–497. doi:10.1521/jscp.2009.28.4.479

Gallagher, M. W., & Lopez, S. J. (2009). Positive expectancies and mental health: Identifying the unique contributions of hope and optimism. *The Journal of Positive Psychology, 4*, 548–556. doi:10.1080/17439760903157166

Gana, K., Daigre, S., & Ledrich, J. (2013). Psychometric properties of the French version of the adult dispositional hope scale. *Assessment, 20*, 114–118. doi:10.1177/1073191112468315

Gilman, R., Dooley, J., & Florell, D. (2006). Relative levels of hope and their relationship with academic and psychological indicators among adolescents. *Journal of Social & Clinical Psychology, 25*, 166–178.

Gustafsson, H., Hassmén, P., & Podlog, L. (2010). Exploring the relationship between hope and burnout in competitive sport. *Journal of Sports Sciences, 28*, 1495–1504. doi:10.1080/02640414.2010.521943

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*, 1–55.

Irving, L. M., Snyder, C. R., Cheavens, J., Gravel, L., Hanke, J., Hilberg, P., & Nelson, N. (2004). The relationships between hope and outcomes at the pretreatment, beginning, and later phases of psychotherapy. *Journal of Psychotherapy Integration, 14*, 419–443. doi:10.1037/1053-0479.14.4.419

Kennedy, P., Evans, M., & Sandhu, N. (2009). Psychological adjustment to spinal cord injury: The contribution of coping, hope and cognitive appraisals. *Psychology, Health & Medicine, 14*, 17–33. doi:10.1080/13548500802001801

Klausner, E. J., Clarkin, J. F., Spielman, L., Pupo, C., Abrams, R., & Alexopoulos, G. S. (1998). Late-life depression and functional disability: The role of goal-focused group psychotherapy. *International Journal of Geriatric Psychiatry, 13*, 707–716. doi:10.1002/(SICI)1099-1166(199810013:10<707:AID-GPS856>3.0.CO;2-Q

Kline, R. B. (2010). *Principles and practice of structural equation modeling* (3rd ed.). New York, NY: Guilford Press.

Lopez, S. J., & Calderon, V. (2011). The gallup student poll: Measuring and promoting what is right with students. In S. I. Donaldson, M. Csikszentmihalyi, & J. Nakamura (Eds.), *Applied positive psychology: Improving everyday life, schools, work, health, and society* (pp. 117–134). New York, NY: Routledge.

MacCallum, R. C. (1995). Model specification: procedures, strategies, and related issues. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts, issues and applications* (pp. 16–36). London: Sage.

Marques, S. C., Pais-Ribeiro, J. L., & Lopez, S. J. (2011). The role of positive psychology constructs in predicting mental health and academic achievement in children and adolescents: A two-year longitudinal study. *Journal of Happiness Studies, 12*, 1049–1062. doi:10.1007/s10902-010-9244-4

Marsh, H. W. (1994). Confirmatory factor analysis models of factorial invariance: A multifaceted approach. *Structural Equation Modeling: A Multidisciplinary Journal, 1*, 5–34.

Marsh, H., Vallerand, R., Lafrenière, M., Parker, P., Morin, A., Carbonneau, N., … Paquet, Y. (2013). Passion: does one scale fit all? Construct validity of two-factor passion scale and psychometric invariance over different activities and languages. *Psychological Assessment, 25*, 796–809.

Ong, A. D., Edwards, L. M., & Bergeman, C. S. (2006). Hope as a source of resilience in later adulthood. *Personality and Individual Differences, 41*, 1263–1273. doi:10.1016/j.paid.2006.03.028

Peterson, S. J., Gerhardt, M. W., & Rode, J. C. (2006). Hope, learning goals, and task performance. *Personality and Individual Differences, 40*, 1099–1109. doi:10.1016/j.paid.2005.11.005

Rand, K. L. (2009). Hope and optimism: Latent structures and influences on grade expectancy and academic performance. *Journal of Personality, 77*, 231–260. doi:10.1111/j.1467-6494.2008.00544.x

Rego, A., Sousa, F., Marques, C., & Pina e Cunha, M. (2012). Hope and positive affect mediating the authentic leadership and creativity relationship. *Journal of Business Research*. doi:10.1016/j.jbusres.2012.10.003

Roesch, S. C., & Vaughn, A. A. (2006). Evidence for the factorial validity of the dispositional hope scale. *European Journal of Psychological Assessment, 22*, 78–84. doi:10.1027/1015-5759.22.2.78

Rolo, C., & Gould, D. (2007). An intervention for fostering hope, athletic and academic performance in university student-athletes. *International Coaching Psychology Review, 2*, 44–61.

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health: Assessment and implications of generalized outcome expectancies. *Health Psychology, 4*, 219–247. doi:10.1037/0278-6133.4.3.219

Snyder, C. R. (1994a). Hope and optimism. In V. S. Ramachandren (Ed.), *Encyclopedia of human behavior* (Vol. 2, pp. 535–542). San Diego, CA: Academic.

Snyder, C. R. (1994b). *Psychology of hope: You can get there from here*. New York, NY: Free Press.

Snyder, C. R. (1995). Conceptualizing, measuring, and nurturing hope. *Journal of Counseling & Development, 73*, 355–360. doi:10.1002/j.1556-6676.1995.tb01764.x

Snyder, C. R. (2002). Hope theory: Rainbows in the mind. *Psychological Inquiry, 13*, 249–275. doi:10.1207/S15327965PLI1304_01

Snyder, C. R., Berg, C., Woodward, J. T., Gum, A., Rand, K. L., Wrobleski, K. K., … Hackman, A. (2005). Hope against the cold: Individual differences in trait hope and acute pain tolerance on the cold pressor task. *Journal of Personality, 73*, 287–312. doi:10.1111/j.1467-6494.2005.00318.x

Snyder, C. R., Feldman, B. D., Shorey, H. S., & Rand, K. L. (2002). Hopeful choices: A school counselor's guide to hope theory. *Professional School Counseling, 5*, 298–307.

Snyder, C. R., Harris, C., Anderson, J. R., Holleran, S. A., Irving, L. M., Sigmon, S. T., … Harney, P. (1991). The will and the ways: Development and validation of an individual-differences measure of hope. *Journal of Personality and Social Psychology, 60*, 570–585. doi:10.1037/0022-3514.60.4.570

Snyder, C. R., Hoza, B., Pelham, W. E., Rapoff, M., Ware, L., Danovsky, M., … Stahl, K. J. (1997). The development and validation of the children's hope scale. *Journal of Pediatric Psychology, 22*, 399–421. doi:10.1093/jpepsy/22.3.399

Snyder, C. R., LaPointe, A. B., Crowson, J. J., & Early, S. (1998). Preferences of high-and low-hope people for self-referential input. *Cognition & Emotion, 12*, 807–823.

Snyder, C. R., Sympson, S. C., Michael, S. T., & Cheavens, J. (2000). The optimism and hope constructs: Variants on a positive expectancy theme. In E. C. Chang (Ed.), *Optimism and pessimism* (pp. 103–124). Washington, DC: American Psychological Association.

Snyder, C. R., Sympson, S. C., Ybasco, F. C., Borders, T. F., Babyak, M. A., & Higgins, R. L. (1996). Development and validation of the State Hope Scale. *Journal of Personality and Social Psychology, 70*, 321–335. doi:10.1037/0022-3514.70.2.321

Stotland, E. (1969). *The psychology of hope*. San Fransisco, CA: Jossey-Bass.

Tong, E. M. W., Fredrickson, B. L., Chang, W., & Lim, Z. X. (2010). Re-examining hope: The roles of agency thinking and pathways thinking. *Cognition & Emotion, 24*, 1207–1215. doi:10.1080/02699930903138865

Ware, J., Snow, K., Kosinski, M., & Gandek, B. (1993). *ST-36 health survey: Manual and interpretation guide*. Boston, MA: The Health Institute, New England Medical Tenter.