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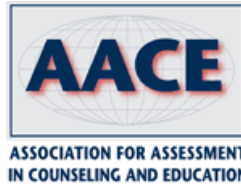
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What is This?

A Validation Study on a New Chinese Version of the Dispositional Hope Scale

Qiwu Sun[1], Kok-Mun Ng[2], and Chuang Wang[2]

Abstract

The authors examined the validity evidence for a newly translated Chinese version of the Dispositional Hope Scale in three samples. Results indicated that the two-factor structure better fit the data than the one-factor structure. Findings provide evidence of configural validity for the scores but only indicate partial factorial invariance across groups.

For two decades, Snyder et al. (1991) have drawn much attention in the literature for hope theory (Brouwer, Meijer, Weekers, & Baneke, 2008; Creamer et al., 2009). The first review on hope in the Chinese language indicated that the construct of hope was highly relevant to variables of psychological well-being (Zhang & Zhen, 2002). Subsequently, several empirical studies on hope on Chinese samples emerged (C. R. Chen, Shen, & Gao, 2009; C. R. Chen, Shen, & Li, 2009; H. X. Chen & Chen, 2008; Lian, 2004). Authors further argued that hope, with its roots in positive psychology, is a viable concept for use among Chinese in developmental counseling that focuses on client growth and empowerment rather than pathological problems (C. R. Chen, Shen, & Li, 2009; Ren, 2006), especially in school settings (Liu, 2001). However, because Snyder's hope theory (Snyder et al., 1991) was rooted and developed in Western cultures, further validation studies in different cultural settings are warranted before it can be applied with confidence across cultures.

Although extant studies using Chinese populations were based on Snyder's Dispositional Hope Scale (DHS; Snyder et al., 1991), several reasons suggest the need for a stringent validation study of the DHS with a Chinese population. First, these studies used different adaptations of the hope scale. For example, Lian (2004) and H. X. Chen and Chen (2008) used the same Chinese version of the DHS translated by Lian in 2004, whereas C. R. Chen, Shen, and Gao (2009) and C. R. Chen, Shen, and Li (2009) used the Chinese version translated by Ren (2006). Second, the translation processes of these two Chinese versions were not rigid enough to meet the current standards of cross-cultural adaptation (Ægisdóttir, Gerstein, & Çinarbas, 2008). Third, the psychometric properties of these translated measures were not systematically and comprehensively investigated. Fourth, these extant studies focused

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on Chinese college students and middle school students; thus, the generalizability of their findings to the greater Chinese population was limited. Finally, professional standards for psychological measures mandate an ongoing validation process for a scale, particularly as it relates to establishing its usefulness for specific populations and purposes (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education, 1999).

To produce cross-culturally significant findings of hope research in China, the research measures adapted for use need to have culturally valid psychometric properties demonstrated through stringent validation methods. In this article, we present the results of a multisample validation study on a newly translated version of the DHS whose translators followed a rigid procedure of cross-cultural adoption based on Ægisdóttir et al.'s (2008) recommendations. The study specifically assessed evidence of configural invariance, factorial invariance across groups, and external aspects of validity for scores from the scale.

Snyder's Hope Theory

Snyder et al. (1991) defined hope as a trait construct comprising two components: *agency thinking* and *pathways thinking*. Agency thinking refers to one's belief about the capacity to initiate and sustain actions toward goals (i.e., goal-directed determination), whereas pathways thinking refers to one's belief about the capacity to generate routes to reach goals (i.e., planning of ways to meet goals; Snyder et al., 1991). Theoretically, agency thinking and pathways thinking are two specific but reciprocal, highly correlated components. Snyder et al. further posited that only in the co-occurrence of agency thinking and pathways thinking will people experience hope.

To be conceptualized as a distinct construct, hope is compared with outcome expectation, perception of self-efficacy, and optimism (Snyder et al., 1991). Snyder et al. posited that outcome expectation and perception of self-efficacy (Bandura, 1977) are domain specific,

whereas hope is a general cognitive set. Though Bandura believed that outcome expectation and perception of self-efficacy affect each other, he emphasized the key roles of perception of self-efficacy in predicting human behaviors. However, in Snyder's hope model, pathways and agency are regarded with the same importance in predicting human well-being (Snyder et al., 1991). Thus, according to hope theory, self-efficacy would be part of domain-specific pathways thinking.

Optimism is a general sense that good things will happen (Scheier & Carver, 1985). In contrast to hope theory, optimism does not include the way to achieve positive gains, which is defined as pathways thinking, a component of hope (Snyder et al., 1991). As such, hope is conceptualized as a distinct construct of its own importance. In sum, Snyder et al. (1991) asserted that "[a]gency/pathways and pathways/agency iterations continue throughout all stages of goal-directed behavior; as such, hope reflects the cumulative level of perceived agency and pathways" (p. 571).

The Dispositional Hope Scale

Based on the above conceptualization of hope, Snyder et al. (1991) developed and validated the DHS, an eight-item trait-like measure of hope with four filter items. The scale consists of two subscales: *Agency* (four items) and *Pathways* (four items). Snyder et al. reported the internal consistencies for the scores from the two DHS subscales to range from .71 to .76 and .63 to .80 for Agency and Pathways, respectively. Subsequent studies reported similar alphas as well as other reliability coefficients (e.g., Roesch & Vaughn, 2006). Snyder et al. demonstrated convergent evidence for the scores from the DHS subscales with significant correlations with generalized positive outcome expectations, control perceptions, self-esteem, and psychological problems. They further demonstrated discriminant evidence of external validity for the scores from the DHS with the construct explaining unique predictive variance above and beyond

positive and negative affectivity in coping and well-being. The evidence of construct validity for the scores from the DHS was demonstrated further in an experiment where researchers were able to manipulate hope as an independent variable resulting in goal-related behaviors as theoretically expected (Snyder et al., 1991). Subsequent studies across cultural groups further supported the validity for the scores from the DHS (e.g., Bryant & Cvengros, 2004; C. R. Chen, Shen, & Li, 2009; Lian, 2004; Roesch & Vaughn, 2006).

The two dimensions measured by the DHS appeared to be different (Bryant & Cvengros, 2004; Irving et al., 2004). Studies on the factorial structure of the DHS further demonstrated that the two-factor model of the DHS better fit the one-factor model representing general hope (e.g., Babyak, Synder, & Yoshinobu, 1993; Roesch & Vaughn, 2006).

Snyder's Hope Theory as a Noncontextual Model

Researchers from the extant studies on hope based on Snyder's theory using Chinese populations all assumed the theory to be noncontextual. Before implementing Snyder's hope model in China, this assumption needs to be investigated.

At the theoretical level, Snyder's hope model describes human's dispositional motivation process. Because individuals' subjective perception of their agency and pathways ability is related to their life goals, and because these life goals are theoretically regarded as humans' basic motivational process in fulfilling their needs (Cantor, 2000; Deci & Ryan, 1985, 2000; Emmons, 1986), hope would be inherently related with humans' basic motivational process. As such, the construct of hope would be universal.

At the empirical level, if Snyder's hope model were universal, then the two-factor DHS would be observed in different cultures. Indeed, many studies demonstrated the two-factor construct of the DHS in culturally different groups. For example, in a study conducted with a large multiethnic sample (51.7% Caucasian, 9.4%

Mexican American, 8.5% Asian American, and 7.7% Filipino American), a two-factor representation of the DHS provided a significantly better fit to the data than a one-factor model (Roesch & Vaughn, 2006). In another study conducted in Austria, Creamer et al. (2009) evaluated the factorial validity for the scores from the DHS with injury survivors. The results of Creamer et al.'s study also supported a two-factor construct of the DHS. Several studies also supported the factorial validity for the scores from the DHS in groups of Chinese middle school students (C. R. Chen, Shen, & Li, 2009; Lian, 2004).

The Present Study

The present multisample study was designed to comprehensively validate the psychometric properties of a Chinese version of the DHS (DHS-C; see the appendix), which was translated by a team led by the first author of this article. The focus of the study was on structural invariance and various aspects of external validity.

Structural Aspect of Validity

On the measurement level, researchers questioned the distinctiveness of the two subscales in the DHS (Roesch & Vaughn, 2006). Brouwer et al. (2008) compared the unidimensional and multidimensional models for the DHS and concluded that it was best to consider the measure as unidimensional because of the high correlation ($r = .91$) between the two subscales. Furthermore, Brouwer et al. found that an exploratory factor analysis pointed to a strong common factor with the first factor having an eigenvalue of 4.47 and the second factor of .74. There is, therefore, the need to further investigate the dimensionality of the DHS. To test the distinctiveness of the two subscales in the DHS, confirmatory factor analysis (CFA) was used. We tested the two-factor model of hope, originally hypothesized by Snyder et al. (1991), and the one-factor model advanced by Brouwer et al. (2008) on three Chinese samples. Based on the assumption of a universal

hope model, we expected the two-factor structure to better fit the data than the one-factor model in the study samples.

Current research evidence supports a universal hope model based on configural invariance (cf. Creamer et al., 2009; Roesch & Vaughn, 2006). However, the evidence of factorial invariance across groups would provide stronger support to the measures' cross-cultural validity. We first examined the evidence of configural invariance for each sample before further assessing the evidence for the measure's factorial invariance across groups.

External Aspect of Validity

To further test the external aspect of validity for the scores from the DHS-C, we built a nomological network for the measure in accordance with hope theory (see Figure 1). Nomological network was first coined by Cronbach and Meehl (1955) as a solid and viable way to test construct validity. The relationships (positive correlation, negative correlation, and noncorrelation) between the DHS-C and other criterion-related variables within the nomological network were expected to offer evidence to support the scale's construct validity. Measures of different criterion variables were administered to different study samples to avoid participant fatigue if all were administered to each sample.

We have argued earlier that Snyder's hope theory is a noncontextual model in that it taps into human's basic motivational process. To test the noncontextual hypothesis, we examined the relationship between hope and the three different motivational orientations presented by Deci and Ryan (1985) in a group of college academic advisors. The three motivational orientations include (a) *Autonomy Orientation*, which means a person is oriented toward aspects of the environment that stimulate intrinsic motivation; (b) *Controlled Orientation*, which indicates a person is oriented toward being controlled by extrinsic factors; and (c) *Impersonal Orientation*, which refers to a person believing that attaining desired outcomes is beyond his or her control (Deci & Ryan, 1985). We hypothesized

that the three motivational orientations were theoretically related with Snyder's hope theory (Deci & Ryan, 1985, 2000):

1. Autonomy Orientation was expected to be associated with a positive sense of agency thinking and pathways thinking.
2. Impersonal Orientation was expected to be associated with negative sense of agency thinking and pathways thinking because the outcome was beyond the person's control.
3. Snyder's model regards hope as a disposition; thus it is not a goal-related state that is objectively defined according to sources external to the person. Because a person with controlled orientation is motivated by external sources, his or her goals might be temporally changed. Thus, such a person was expected to be characterized by having lower levels of hope.

Testing of the relationships between the three motivational orientations and hope was expected to help verify the convergent and discriminant evidence of external validity for the scores from the DHS-C.

Based on Snyder's hope theory, people with higher levels of hope were expected to have better agency in facing work related stressors and better able to find the corresponding pathways in overcoming these stressors. Consequently, college academic advisors were expected to experience less stress and less burnout at work. Similar to Snyder et al.'s (1991) study, the scores on the DHS-C were hypothesized to be negatively correlated with job burnout among teachers.

Snyder et al. (1991) assumed that people who perceived themselves with high ability of setting goals and generating pathways to obtain such goals would consequently experience positive emotional state and an increased sense of subjective well-being. Based on hope theory and the other findings in the literature (e.g., Bruininks & Malle, 2005; Chang, 2003;

C. R. Chen, Shen, & Li, 2009; H. X. Chen & Chen, 2008; Snyder et al., 1991), scores from the DHS-C were hypothesized to be positively correlated with subjective well-being. In this present study, this relationship was examined in a college student sample.

In efforts to demonstrate hope as a general construct across populations, we also examined the relationship between the DHS-C and quality of life in a sample of individuals who were suffering from cancer. In accordance to hope theory, we expected quality of life, including daily function, to be positively correlated with scores on the DHS-C and the severity of symptom to be not significantly correlated with the scores on the DHS-C, thus demonstrating the discriminant evidence of external validity for the scores from the measure.

To check the utility of the differentiation of the two components of the DHS, we further tested the unique contribution of Agency and Pathways in predicting the criterion variables via hierarchical regression when the factorial invariance was confirmed. We expected Pathways to contribute above and beyond the contribution of Agency.

Method

Sampling Procedures

To test the construct validity for the scores from the DHS-C, three convenience samples with different life experiences and backgrounds were recruited. Participants were recruited because of their accessibility to the first author. Three different Chinese samples were selected to allow for cross-group comparison study. We expected that data based on three different samples would allow for a strong testing of the cross-cultural validity of Snyder et al.'s (1991) hope model as measured by the DHS-C.

The first sample consisted of college academic advisors from different higher education institutions in Hubei, a province in central China. They were recruited while were attending postvocational training programs held in Wuhan, the largest city in the province. In addition to academic advising, these individuals also taught classes at the college level. Surveys were handed out during the training for participants to complete in class. The second sample consisted of college students recruited at a university in Wuhan, China. The study materials were distributed during class to students who were interested in participating. These participants completed and returned the research materials in class. The third sample consisted of patients suffering from cancer. Data from these patients were collected individually by the first author in a hospital located in Wuhan over 3 months.

All participants voluntarily participated in the research and no incentives were given for their participation. The study materials were completed in Chinese.

Participants

Sample 1 consisted of 345 college academic advisors with 199 (57.7%) males and 146 (42.3%) females. Participants' mean age was 30.26 years ($SD = 4.23$). Of these, 273 (79.1%) participants had master's degrees and 72 (20.9%) had bachelor's degrees. Sample 2 consisted of 250 undergraduate students with 115 (46.0%) males and 135 (54.0%) females. Their mean age was 21.12 years ($SD = 1.25$). Sample 3 consisted of 90 patients with 57 (63.3%) males and 33 (56.7%) females who were suffering from malignant tumor. The mean age of this sample was 55 years ($SD = 15.00$).

Instruments

Dispositional Hope Scale–Chinese (DHS-C). We employed a three-step translation process recommended in the literature (Ægisdóttir et al., 2008) to obtain a Chinese translation of the DHS. First, two associates of the first author who were familiar with the literature of hope independently translated the DHS into Chinese. Any differences between the independent translations were discussed and adjusted to achieve consensus on the best and most accurate translation of the items. Next, the translated Chinese version was then translated back into English by another associate of the first

author. Finally, two other experts independently evaluated the original and back-translated versions. Items indicating biased translation were discussed and evaluated again. This procedure was done twice to ensure accuracy and agreement of the translation. Both associates used in this translation process held graduate-level English competency. The two experts were bilingual Chinese Americans who have lived in the United States for more than 20 years.

Both a 4- and an 8-point Likert-type rating scales were used in previous studies for item endorsement; for example, Brouwer et al. (2008) used an 8-point scale and Snyder et al. (1991) used a 4-point scale. The current study elected to use an 8-point Likert-type scale (1 = *definitely false* to 8 = *definitely true*) in Samples 1 and 3 and a 4-point scale in Sample 2 (1 = *definitely false to* 4 = *definitely true*). The Cronbach's alphas of the subscale scores of the DHS-C for the three samples are reported in a table later in the article. The αs for both subscale scores were greater than .70 in most cases, except in Sample 2. Similar alpha values were previously reported by Snyder et al.

General Well-Being Scale (GWBS). The GWBS (Fazio, 1977) is a 33-item self-report inventory that assesses six factors of subjective well-being, namely, *Anxiety*, *Depressed Mood*, *Sense of Positive Well-being*, *Self-control*, *General health*, and *Vitality*. The current study used the Chinese version of the GWBS (Fan, 1993), and it was administered to Sample 2. Total scores were used. The Cronbach's α of the GWBS in the current study was .83.

The General Causality Orientations Scale (GCOS). The GCOS is a 36-item scale that assesses the strength of three different motivational orientations within an individual, namely *Autonomy*, *Controlled*, and *Impersonal* (Deci & Ryan, 1985). We used the same back-translation procedure used to create the DHS-C to create the Chinese version of the GCOS. The GCOS was administered to Sample 1. Total scores of the three subscales were used. The internal reliability of coefficients for scores from the Autonomy, Controlled, and Impersonal in the current study were .70, .60, .66, respectively.

Maslach Burnout Inventory–General Survey (MBI-GS). The MBI-GS (Maslach, Jackson, & Leiter, 1996) is a 15-item self-report instrument using a 7-point Likert-type rating scale that assesses burnout in the work context. The current study used the Chinese version of MBI-GS, which was revised by Li and Shi (2003). It was administered to Sample 1. Total scores were used in this study. The Cronbach's α of the MBI-GS scores in the current study was .86.

Quality of Life Questionnaire Core–30 (QOL-30). The QOL-30 (Aaronson et al., 1993) is a 30-item scale designed to assess the quality of life of patients suffering from cancers. The QOL-30 has three subscales: *Global Health Status* (GHS), *Functional*, and *Symptom*. The total scores in each of the subscales were used in this study. The Chinese version of the QOL-30 and the manual of the QOL-30 were obtained from the European Organization for Research and Treatment of Cancer. It was administered to Sample 3. The internal reliability coefficients for the scores from the GHS, Functional scale, and Symptom scale were .89, .88, and .72, respectively.

Results

Configural Invariance

We conducted CFA using LISREL 8.7 to test and compare the proposed one- and two-factor models of the DHS-C on the three study samples. A covariance matrix was analyzed and the parameters were estimated using the maximum likelihood method because preliminary analyses suggested that the assumption of multivariate normality of the data was met. In accordance to recommendations in the literature (Hu & Bentler, 1999; Jackson, Gillaspy, & Purc-Stephenson, 2009), commonly used multiple fit indices from different families were selected as joint criteria to evaluate the models' goodness of fit. These indices included χ^2 value and the associated degrees of freedom and probability value, comparative fit index (CFI), root mean square error of approximation (RMSEA), Bentler–Bonett nonnormed fit index (NNFI), and standardized root mean square

Table 1. Chi-Square and Goodness-of-Fit Values for the Tested Models for Three Study Chinese Samples

Group	N	χ^2	df	p	RMSEA	NNFI	CFI	SRMR	ECVI	AIC
One-factor model										
Sample 1	345	71.30	20	<.05	.086	.95	.96	.046	.30	103.25
Sample 2	250	58.98	20	<.05	.097	.93	.95	.056	.40	98.54
Sample 3	90	44.15	20	<.05	.120	.88	.91	.094	.88	78.41
Two-factor model										
Sample 1	345	57.83	19	<.05	.078	.96	.97	.041	.27	92.36
Sample 2	250	49.94	19	<.05	.087	.95	.96	.052	.36	88.63
Sample 3	90	32.50	19	<.05	.082	.93	.95	.083	.72	64.30

Note: CFI = comparative fit index; GFI = goodness-of-fit index; NNFI = Bentler–Bonett nonnormed fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; ECVI = expected cross-validation index; AIC = Akaike information criterion.

residual (SRMR). Hu and Bentler's (1999) recommended cutpoints for these indices were used as guidelines for evaluating goodness of fit: CFI ≥ .95, NNFI ≥ .95, RMSEA ≤ .06, and SRMR ≤ .08. Because of our intent to compare the one-factor model with the two-factor model, we further included the expected cross-validation index (ECVI) and Akaike information criterion (AIC). The model with comparatively smaller ECVI and AIC values is believed to better fit the data (Byrne, 1998).

Table 1 presents the CFA results on the tested models for the three samples. For Sample 1, the NNFI, CFI, and SRMR values fell within Hu and Bentler's (1999) recommendations, indicating that both models fit the data well, though the RMSEA values in both models exceeded the recommended value. The same applied to Sample 2, except for the NNFI value of .93 in the case of the one-factor model.

The RMSEA, NNFI, CFI, and SRMR values for Sample 3 for the one-factor model all met Hu and Bentler's (1999) criteria. The RMSEA value exceeded .10. These results indicated that the one-factor model had a poor fit in Sample 3. But these indices either met or came close to meeting Hu and Bentler's recommendations in the two-factor model for Sample 3, indicating acceptable fit. The overall CFA results provided support for the configural validity for the scores from the DHS-C for the two-factor structure.

The ECVI and AIC values for each sample were smaller for the two-factor model than those for the one-factor model (see Table 1). These results further showed that the data fit the two-factor model better than the one-factor model. The difference of χ^2 between the two-factor model and one-factor model was statistically significantly different from zero for each sample: $\Delta\chi^2(1) = 13.47$, $p < .01$, for Sample 1; $\Delta\chi^2(1) = 9.04$, $p < .01$, for Sample 2; and $\Delta\chi^2(1) = 11.65$, $p < .01$, for Sample 3. Subsequent test for factorial invariance across groups was carried out based on the two-factor model.

Factorial Invariance Across Samples

Dimitrov (2010) suggested three steps and five models to test factorial invariance across groups: (a) configural invariance, (b) measurement invariance, and (c) structural invariance. Configural invariance was tested by fitting a baseline model for each group separately without any constraints (Model 0). Weak measurement invariance was tested by constraining the factor loadings to be the same across the groups (Model 1). Strong measurement invariance was tested by constraining both factor loadings and item intercepts to be the same across the groups (Model 2). Strict measurement invariance was tested by constraining

Table 2. Testing for Factorial (Measurement and Structural) Invariance

Model	df	χ^2	Δdf	$\Delta\chi^2$	CFI	ΔCFI	RMSEA
Across three groups							
M0	57	140.27			.97		.08
M1	75	263.85	18	123.58*	.91	.06	.11
Between Sample 1 and Sample 2							
M0	38	107.77			.97		.08
M1	47	191.79	9	84.02*	.92	.05	.10
Between Sample 2 and Sample 3							
M0	38	82.44			.97		.08
M1	47	177.50	9	95.06*	.92	.05	.13

Note: χ^2 = conventional chi-square fit statistic (under maximum likelihood estimation); CFI = comparative fit index; RMSEA = root mean square error of approximation; M0 = baseline model (no invariance imposed); M1 = invariant factor loadings.
*$p < .01$.

Table 3. Testing for Factorial (Measurement and Structural) Invariance (Samples 1 and 3)

Model	df	χ^2	Model Comparison	Δdf	$\Delta\chi^2$	CFI	ΔCFI	RMSEA
M0	38	90.33				.98		.06
M1	47	98.46	M1 − M0	9	8.13	.97	−.01	.07
M2	53	124.32	M2 − M1	6	25.86*	.95	−.02	.08
M2P	52	108.58	M2P − M1	5	2.02	.96	−.01	.08
M3	61	152.59	M3 − M2P	9	44.01*	.94	−.02	.09
M3P	58	120.99	M3P − M2P	6	12.41	.95	−.01	.07
M4	54	113.97	M4 − M2P	2	5.39	.96	.00	.07

Note: χ^2 = conventional chi-square fit statistic (under maximum likelihood estimation); CFI = comparative fit index; RMSEA = root mean square error of approximation; M0 = baseline model (no invariance imposed); M1 = invariant factor loadings; M2 = invariant factor loadings and invariant intercepts; M2P = invariant factor loadings and partially invariant intercepts (free intercept of Item 10); M3 = invariant factor loadings, partially invariant intercepts, and invariant residual variances; M3P = invariant factor loadings, partially invariant intercepts, and partially invariant residual variances (free residual variances for Items 1, 4, and 8); M4 = invariant factor loadings, partially invariant intercepts, and invariant factor variances and covariances. ΔCFI < −.01 signals lack of invariance targeted by the respective comparison of nested models.
*$p < .01$.

factor loadings, item intercepts, and residual variance/covariances to be the same across the groups (Model 3). Finally, structural invariance was tested by constraining factor loadings, item intercepts, and factor variances/covariances to be the same across the groups (Model 4). Statistically significant changes in $\Delta\chi^2$ and changes in CFI values of less than −.01 were used to flag significant/substantial differences when testing the models (Cheung & Rensvold, 2002).

The goodness-of-fit indices suggested that even the weak measurement invariance was not satisfied across the three groups (Table 2),

indicating that the hypothesized universality of the two-factor structure was not supported. Subsequent pairwise comparisons suggested that the measurement invariance was not met between Samples 1 and 2 or between Samples 2 and 3 (Table 2). As a result, comparisons were only made between Samples 1 and 3.

As shown in Table 3, invariance of factor loadings was satisfied between Samples 1 and 3 (M1 − M0), $\Delta\chi^2(9) = 8.13$, $p > .05$, but not complete invariance of the intercepts (M2 − M1), $\Delta\chi^2(6) = 25.86$, $p < .01$. By freeing the intercept for Item 10 (i.e., allowing the intercept for Item 10 to have different estimates
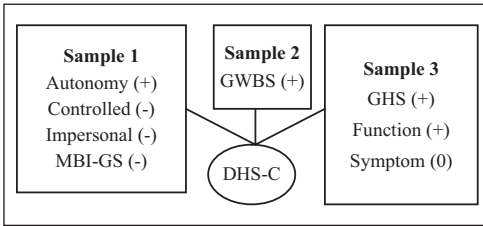
Figure 1. The nomological network for the Chinese Dispositional Hope Scale (DHS-C) with different criterion variables tested in three samples

Note: MBI-GS = Maslach Burnout Inventory–General Survey. GWBS = General Well-Being Scale. The correlations between DHS-C and the corresponding criterion variables are indicated in parentheses: + = positive, − = negative, 0 = no relationship. Autonomy, Controlled, and Impersonal are three subscales of the General Causality Orientations Scale. Global Health Status (GHS), Function, and Symptom Severity are three subscales for the Quality of Life Core–30 scale.

across the two groups), the modified model was no longer statistically significantly different from Model 1 (M2P − M1), $\Delta\chi^2(5) = 2.02$, $p > .05$. Thus, we concluded that Sample 1 and Sample 3 had invariant factor loadings and invariant intercepts except for the intercept of one indicator (Item 10).

As for the invariance of item uniqueness, Sample 1 and Sample 3 did not have complete invariant residual variances (M3 − M2P), $\Delta\chi^2(9) = 44.01$, $p < .01$. By freeing the residual variance of Items 1, 4, and 8, we were able to reduce the chi-square difference to a statistically nonsignificant value (M3P − M2P), $\Delta\chi^2(6) = 12.41$, $p > .05$. Therefore, we concluded that Samples 1 and 3 had partial measurement invariance of all factor loadings, $\Delta\chi^2(9) = 8.13$, $p > .05$; invariance of all but one intercept, $\Delta\chi^2(5) = 2.02$, $p > .05$; and invariance of all but three item uniqueness, $\Delta\chi^2(6) = 12.41$, $p > .05$. Finally, Samples 1 and 3 also had structural invariance because the chi-square difference between Model 4 (imposing invariant factor variances and covariances) and Model 2P (invariant factor loadings and partially invariant intercepts) was not statistically significant, $\Delta\chi^2(2) = 5.39$, $p > .05$.

External Aspect of Validity

Though factorial invariance across the three study samples was not supported by the data and Sample 2 might likely have a different factor structure from that of Samples 1 and 3, we decided to continue with analyses that focused on examining external aspects of validity for the scores from the DHS-C because findings on the measure's configural validity (Table 1) supported the two-factor model in all three samples. Hence, it was believed that additional analyses would add insight to other aspects of validity for the scores from the DHS-C.

Based on the theory and existing literature, we built a nomological network (see Figure 1) to further examine the construct validity for the scores from the DHS-C. The results generally supported our hypotheses (Table 4). The links between Pathways, Agency, and most of the criterion variables were statistically significant at the .01 level, except that between the Controlled orientation of the GCOS and the two hope subscales and that between the Function and Symptom Severity scale of the QOL-30 and the two hope subscales. The directions of the correlations among the subscales of the DHS-C and the criterion variables across the three samples were as expected. The findings of significant positive correlations with Autonomy orientation and the findings of negative correlation with Impersonal orientation and job burnout support the concurrent validity for the scores from the DHS-C. The findings of significant positive correlations with well-being and general health status support the criterion validity for the scores from the DHS-C.

Because the Symptom subscale in the QOL-30 assessed the severity of physical symptoms related to suffering from cancer (e.g., fatigue and pain), it was not expected to be associated with one's cognitive perceptions and beliefs about their sense of agency and ability to generate pathways to achieve certain goals. In Sample 3, as expected, symptom severity was not significantly correlated with Agency and Pathways (Table 4). Such lack of relationship supports the discriminant evidence of external validity for the scores from the hope subscales.

Table 4. Means, Standard Deviations, and Pearson Moment Correlations (α) of Study Variables

Variable	M	SD	1	2	3	4	5	6
Sample 1 (*n* = 345)								
1. Agency	23.59	4.28	.74	.69*	.24*	.05	−.19*	−.38*
2. Pathways	23.38	4.48		.74	.25*	.08	−.18*	−.29*
3. Autonomy	65.08	9.03			.70	.52*	.22*	−.03
4. Controlled	54.97	8.58				.60	.49*	.16*
5. Impersonal	42.28	9.06					.66	.28*
6. MBI-GS	47.72	11.95						.86
Sample 2 (*n* = 250)								
1. Agency	10.49	1.94	.73	.54*	.47*			
2. Pathways	11.87	1.78		.67	.35*			
3. GWBS	116.10	13.08			.83			
Sample 3 (*n* = 90)								
1. Agency	24.37	4.55	.77	.60*	.42*	.14	−.04	
2. Pathways	23.42	4.55		.85	.45*	.38	−.16	
3. GHS	2.34	0.66			.89	.52*	−.32*	
4. Function	2.63	0.57				.88	−.47*	
5. Symptom Severity	1.43	0.52					.72	

Note: MBI-GS = Maslach Burnout Inventory–General Survey; GWBS = General Well-Being Scale. Agency and Pathways are two subscales of the Dispositional Hope Scale. Autonomy, Controlled, and Impersonal are three subscales of the General Causality Orientations Scale (GCOS). General Health Status (GHS), Function, and Symptom Severity are three subscales of the Quality of Life Questionnaire Core–30 (QOL-30).
*p < .01.

However, the Function subscale in the QOL-30 was expected to be significantly associated with the two hope subscales because the Function subscale was used to assess cancer patients' functioning in domains such as physical, emotional, cognitive, and social. The statistically nonsignificant relationship between Function and the two hope subscales at the .01 level indicated a lack of support for criterion validity of the scores from the DHS-C.

Utility in Differentiating the Two Subscales

We conducted hierarchical regression analyses using SPSS13.0 to further test the utility of both Pathways and Agency subscales in predicting different criterion variables in these three samples. Table 5 displays the summary of the results.

In Sample 1, Agency (Step 2) and Pathways (Step 3) were used to predict job burnout (MBI-GS) when Controlled orientation and Impersonal orientation were controlled. Results showed only Agency, ΔR^2 = .11, $\Delta F(1, 312)$ = 43.07, p < .001, significantly contributed to the variance of MBI-GS. Pathways did not meaningfully predict the variance of MBI-GS ($t = -1.28, p > .05$).

In Sample 2, Agency (Step 1) and Pathways (Step 2) were used to predict well-being (GWBS). Results showed both Agency, ΔR^2 = .22, $\Delta F(1, 248) = 68.66, p < .001$, and Pathways, ΔR^2 = .01, $\Delta F(1, 247) = 4.11, p < .05$, significantly contributed to the variance of GWBS. However, the unique contribution of Pathways was small, and the β for Agency (.39) was three times stronger than that for Pathways (.13).

In Sample 3, Agency (Step 1) and Pathways (Step 2) were regressed onto cancer patients' GHS because the other two subscales of quality of life (i.e., Function and Symptom) were not significantly associated with Agency and Pathways. Results of the final model revealed only Pathways, ΔR^2 =.06, $\Delta F(1, 87) = 6.99$, p < .01, significantly contributed to the variance of GHS. The unique contribution of Agency

Table 5. Summary of Hierarchical Regression Analyses for Agency and Pathways Predicting Criterion Variables Across Samples

	Criterion Variables	n	B	SE	β	t	ΔR^2	Adjusted R^2	ΔF
Sample 1									
	MBI-GS	345							
Step 1							.08	.08	13.95**
Control			.06	.09	.04	0.66			
Impersonal			.36	.08	.27	4.31**			
Step 2							.11	.11	43.07**
Controlled			.15	.08	.10	1.76			
Impersonal			.23	.08	.17	2.88*			
Agency			−.96	.15	−.34	−6.56**			
Step 3							.004	.004	1.63
Controlled			.16	.08	.11	1.91			
Impersonal			.22	.08	.16	2.71*			
Agency			−.79	.19	−.29	−4.16**			
Pathway			−.23	.18	−.09	−1.28			
Sample 2									
	GWBS	250							
Step 1							.22	.21	68.66**
Agency			3.14	.38	.47	8.29**			
Step 2							.01	.22	4.11
Agency			2.64	.45	.39	5.89**			
Pathway			.99	.49	.13	2.03			
Sample 3									
	GHS	90							
Step 1							.17	.16	18.39*
Agency			.03	.42	4.29**				
Step 2							.06	.22	6.99*
Agency			.03	.23	1.95				
Pathway			.03	.31	2.64*				

Note: MBI-GS=Maslach Burnout Inventory–General Survey; GHS = Global Health Status; GWBS = General Well-Being Scale. Controlled and Impersonal are subscales of the General Causality Orientations Scale. To prevent participant fatigue, different criterion variables were administered to different samples.
*$p < .01$. **$p < .001$.

disappeared when Pathways was entered into the regression model.

Overall, the hierarchical regression results supported the utility in differentiating the two hope subscales. The results further revealed the two subscales exhibited different effects on most of the tested criterion variables.

Discussion

Findings in the present multisample study provide some support for the psychometric properties of the DHS-C as well as the applicability of the two-factor construct of hope proposed by Synder et al. (1991) among Chinese. However, the finding of partial factorial invariance across groups raises question about the noncontextual hypothesis of the model.

Factorial Invariance

The CFA findings for configural validity for the scores from the hope subscales across the three Chinese samples support the measure's

hypothesized two-factor structure to better fit the data than the one-factor structure proposed by Brouwer et al. (2008). These finding are consistent with most findings in the literature (Babyak et al., 1993; C. R. Chen, Shen, & Li, 2009; Lian, 2004; Roesch, & Vaughn, 2006; Snyder et al., 1991).

Results from the multigroup invariance study support the two-factor structure of the DHS-C's partial factorial invariance across Samples 1 and 3 but not in Sample 2. Several factors could have contributed to such mixed findings. First, the invariance could have resulted from the difference in the rating scales used because a 4-point Likert-type scale was used in the administration of the DHS-C for Sample 2, whereas an 8-point Likert-type scale was used in Samples 1 and 3.

Second, the factorial variance could have resulted from background variable differences between the samples, such as gender, age, and life experiences. Background differences among the samples were significant because Sample 1 consisted of college academic advisors with a mean age of 30.26 years, Sample 2 was made up of undergraduate college students with a mean age of 21.12 years, and Sample 3 comprised cancer patients with a mean age of 55 years. Participants in Samples 1 and 3 tended to be older and had more life experiences compared with those in Sample 2.

Reliability Estimates

In most instances, the internal reliability coefficients for the scores from the hope subscales were greater than .70, indicating acceptable level of score consistency (Nunnally, 1978). Though the reliability coefficients dropped below the conventional .70 threshold to .67 in Sample 2, similar range was reported by Snyder et al. (1991). Hence, additional work should be performed to improve the reliability of the scores from the Chinese hope subscales.

External Aspect of Validity

The findings of conceptually meaningful associations between the hope subscales and selected criterion variables within a nomological

network in different study samples further strengthen the construct validity of the scores from the hope measure. Hierarchical regression findings further strengthen the argument for the utility in separating the two components of hope as originally theorized by Snyder et al. (1991). Though Agency and Pathways were found to be associated moderately high with each other, they each exhibited unique relationships with some of the criterion variables.

Our findings indicate that, in general, Agency is a stronger predictor than is Pathways. Agency accounted for 22% of the variance of general well-being of university students, and Pathways did not account for additional variance of general well-being. Agency accounted for 11% of the variance of job burnout, and Pathway did not account for any more of the variance after motivational orientation was controlled. However, Pathways accounted for an additional 6% of the variance of general health status among cancer patients above and beyond the 17% accounted for by Agency. Agency and Pathways share a considerable amount of variance, though the latter does account for a small amount of unique variance in some cases, which may have practical significance. Our findings concur with those in the literature that indicate agency thinking to be a stronger predictor for well-being indicators compared with pathways thinking (Arnau, Rosen, Finch, Rhudy, & Fortunato, 2007; Chang, 2003; H. X. Chen & Chen, 2008).

When reexamined with a less stringent p value of .05, Pathways was found to contribute significantly an additional 1% of the variance of general well-being among university students. At this alpha level, Pathways was also significantly associated with the function portion ($r = .39$, $N = 90$) of the quality of life of cancer patients, whereas Agency ($r = .14$) was not. These findings indicate further plausible support for the uniqueness of the two hope factors.

The uniqueness between Pathways and Agency bears implications for counseling practice. For example, patients who believe they can generate more routes (Pathways Thinking) to obtain their goals may also experience higher levels of functioning, whereas their belief in

their capacity to initiate and achieve goals (Agency Thinking) may not matter to their experience of functioning. As such, counselors working with cancer patients may want to focus on helping their clients to increase their self-efficacy on generating goal-directed behavior with a view toward increasing their functioning in different life domains. However, because the relationship between function and pathways thinking was only statistically significant at the .05 level, we recommend further verification with studies using more stringent statistical criteria.

Though results in this study provided only partial support to the construct of hope among Chinese, counselors who are working with Chinese clients using the hope framework should consider the relationship between the two hope components as well as the uniqueness of each component. For example, different interventions may be needed to target different hope components. Also, helping clients improve their self-efficacy in generating routes to obtain their desired goals can potentially contribute to helping them improve their functioning level even when their general sense of agency may not be good. Furthermore, counselors should also keep in view the potential influence of background variables, such as life experiences, age, gender, and cultural beliefs, on the experiences and perceptions of their clients regarding hope.

Our findings should be further verified by future replication studies. Future studies should also examine the factors that contribute to the differential effects of Agency and Pathways on various human functioning variables and their implications on therapeutic intervention (Irving et al., 2004).

Limitations and Recommendations

Several limitations do affect the interpretation of the present findings. First, the DHS-C was an adaptation of the English version of the DHS. There is a need to develop indigenous hope scales to further investigate the construct of hope among the Chinese. This study had only focused the structural and external aspects of the DHS-C. We did not address other issues

relevant to cross-cultural validity such as semantic equivalence. Future studies should also investigate the scale's test–retest reliability to further shed light on the nature of the scores from the scale as it relates to its reliability in measuring hope as a trait.

Second, the failure to demonstrate factorial invariance across groups in the present study may be related to factors specific to the DHS-C and the study samples that are unrelated to the original version of the DHS. Culture-specific factors related to the DHS-C, the hope construct, and response pattern of the Chinese participants were not addressed. As indicated by a reviewer of this article, though the construct of hope and the DHS were hypothesized to be noncontextual, some of the items in the scale appeared to be contextual and circumstantial, for example, "My past experiences have prepared me well for my future" (Item 9).

We recommend researchers to explore if culture-specific goals interact with hope among Chinese. The content of goals might increase the understanding of the process of hope. The content of goals may differ among cultures; however, the function of goals is expected to be the same. In other words, hope may function in the same way across cultures, whereas the content of the goals and the habituated ways to obtain the goals may be different. Future investigations could directly test the interaction of hope and cultural variables such as individualism and collectivism. Individuals in a collective culture such as the Chinese may tend to generate group-oriented goals, and when they experience difficulties in finding ways to accomplish such goals, they may experience lower levels of hope. Knowing how cultural variables interact with hope, practitioners can develop culturally responsive interventions to help clients improve their level of hope.

Third, the link between the Controlled subscale of the GCOS and the DHS-C was unexpected. Whereas Deci and Ryan (1985) reported that Autonomy was not correlated with Controlled ($r = .03$) and Autonomy and Impersonal ($r = -.25$, $p < .01$) and Impersonal and Controlled ($r = .27$, $p < .01$) were moderately correlated, respectively, such a correlation pattern was not found in the current Chinese

samples. The reason could be related to the score reliability of the GCOS. Further investigation into the psychometric properties of the GCOS in Chinese is recommended.

Fourth, the generalization of our conclusion is limited by the convenience sampling method used in the study. However, the focus of the present work was to verify the psychometric properties of the DHS-C. Therefore, further work on hope and its correlates among Chinese should include a representative sample of the Chinese population. Influence of background variables on hope should also be investigated.

Finally, the second sample used the 4-point Likert-type scale, whereas the other two samples used the 8-point Likert-type scale. Although the CFA results indicated that the scoring method did not affect the configural validity for the scores from the DHS-C, the scoring method difference might have contributed to the findings of only partial factorial invariance across groups. However, the present study did not further investigate such effects. This represents a shortcoming in design of the present study. Future analysis using more sophisticated methods such as Rasch modeling can provide item-level data to further verify the presence of rating scale effects.

Conclusion

The current study has extended the application of hope theory to the Chinese population. In summary, our study provided findings supportive of the originally proposed two-factor structure for the newly translated Chinese version of the DHS, though factorial invariance across groups was only partially supported. The construct validity for the scores from the DHS-C was further indicated by evidence of external validity. We believe the present study has provided initial findings supportive of the DHS-C's psychometric properties and utility in China and added to the cross-cultural literature on hope. Given that only partial factorial invariance across groups was found, we recommend that more work investigating the measure's factorial invariance across groups of Chinese with differing background char-

acteristics and other psychometric properties (e.g., test–retest reliability) be done before using it to conduct hope research in the Chinese population. Although keeping in view the limitations of the construct of hope based on the findings in this study, we believe counselors working with Chinese clients could consider using the theoretical framework of hope to work with their clients to improve their general well-being and functioning.

Appendix

特质希望量表 (Dispositional Hope Scale)
　　(说明：实际使用中量表名称为"目标量表")

1. 我能想出很多办法让自己摆脱困境
2. 我会总是积极地追求自己的目标
3. 我常常感到疲惫
4. 任何一个问题都有很多种解决方法
5. 在争论中我很容易处于下风
6. 我能想出很多方法来得到生活中对我最重要的东西
7. 我为我的健康担心
8. 即使别人想要放弃，我仍然相信我能找出解决这个问题的方法
9. 我过去的经验对我以后达到目标很有帮助
10. 到目前为止我成功的时候比较多
11. 我常常发现自己在为某件事担心
12. 我通常能达成我给自己设定的目标

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