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Further Validation of the Humor Styles Questionnaire in Mainland China

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Abstract

The aim of the present research is to further validate the Humor Styles Questionnaire in Mainland China. Two studies were conducted on the basis of preliminary results of Chen and Martin (2007). In Study One, a pool of 53 items of the Humor Styles Questionnaire (HSQ) was administered to 156 university students and 114 university teachers. The results of item analysis and exploratory factor analysis supported the four-factor model of the HSQ. 25 items were retained for the HSQ. The results of confirmatory factor analysis using a sample of 388 university teachers with the HSQ indicated a good data fit to the model. In Study Two, the HSQ and other measures (such as Big-Five personality, attachment and depression, positive/negative emotion, and job satisfaction) were administered to several different Chinese samples, respectively. The correlations between the four HSQ factors and other measures supported the hypothesis that affiliative and self-enhancing humor were potentially beneficial, while aggressive and self-defeating humor were potentially maladaptive. Overall, the research supports the validity and reliability of the 25-item Chinese HSQ in mainland China.

KeyWords: Humor Styles Questionnaire, Validation, Mainland China

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1 Introduction

Humor is a stable personality trait and individual difference (Erickson & Feldstein, 2007). Past research tends to consider that humor is an obvious benefit and that people who have a sense of humor are more likely to get the approval of others. For example, Social psychologists have confirmed the following functions of humor: communicating group norms, reinforcing group status, and fostering group cohesion and identity (e.g., Long & Graesser, 1988; Robinson & Smith-Lovin, 2001; Shiota et al., 2004). However, in recent years, researchers have begun to note that not all humor is good for the body and mind (eg., Tao, Tian & Shen, 2011; Yue et al., 2010). After analyzing the relevant research literature on humor and subjective well-being, Martin and his colleagues have proposed the Humor Styles Questionnaire (HSQ; Martin et al., 2003) to assess the four types of humor styles: affiliative, self-enhancing, aggressive, and self-defeating humor. The first two (affiliative and self-enhancing humor) are adaptive and potentially beneficial to psychological well-being, while the other two (aggressive and self-defeating humor) are maladaptive and potentially detrimental (Martin et al., 2003, 2007). For example, affiliative humor was related to harmonious interpersonal relationships, while self-defeating humor reflects inner neediness and low self-esteem (Klein & Kuiper, 2006). Adaptive humor styles had a significant positive relationship with adaptive emotion regulation and subjective well-being, whereas maladaptive humor styles were positively related to maladaptive emotion regulation and negatively subjective well-being (Amjad & Dasti, 2022).

After the appearance of HSQ, HSQ has been translated into several different countries' versions: Belgium (Saroglou & Scariot, 2002), America (Cassaretto & Martínez, 2009; Erickson & Feldstein, 2007), Arab (Kazarian & Martin, 2004, 2006; Taher et al., 2008), Italy (Sirigatti et al., 2014), German and Switzerland (Ruch & Heintz, 2016). All the cross-cultural versions supported the four-factor model of humor styles and item loadings of each dimension revealed that the four factors corresponded closely to the original proposal.

HSQ has been translated into traditional Chinese by Taiwanese scholars (Chan et al., 2011). They found that the Taiwanese translation of HSQ had good validity and reliability, which is completely applicable in Taiwan. However, when the authors of this paper carefully read Chan et al.'s (2011) paper, it was found that exploratory factor analysis with the Taiwanese translation of HSQ was not conducted and factor loadings on the HSQ subscales were not reported. We doubt that there exists a fatal flaw in Chan et al.'s (2011) study.

To test the criterion validity of the HSQ, relations of the humor styles with health and personality were examined in numerous studies (e.g., Martin et al., 2003; Saroglou & Scariot, 2002; Chen & Martin, 2007; Chan et al., 2011; Ruch & Heintz, 2013, 2017). Affiliative and self-enhancing humor styles went along with lower depression, anxiety, and SCL-90 scores, while self-esteem, optimism, social intimacy, and well-being showed the opposite correlation patterns. Regarding Big-Five personality traits, extraversion and openness were significantly related to higher affiliative and self-enhancing humor styles, and extraversion also to a higher aggressive humor style. Neuroticism correlated negatively with the affiliative and self-enhancing and positively with the aggressive and self-defeating humor style. Agreeableness went along with lower aggressive and self-defeating humor styles. Conscientiousness was related negatively to the aggressive and self-defeating humor styles. These results indicated that the HSQ was consistently related to psychological health and personality.

Chen and Martin (2007) translated the 32-item HSQ (Martin et al., 2003) and the CHS (Coping Humor Scale; Martin & Lefcourt, 1983) in Chinese and administered these two humor scales to 354 university students. The English version of the HSQ was translated into Chinese by a Chinese professor in English literature. Then, this Chinese translation version of HSQ was back-translated into English by another professor in English literature. The original author of the HSQ, Professor Rod A. Martin read the back-translated English version to verify the accuracy of the translation. The Chinese translation of the HSQ was finalized after translators' discussions and revisions according to the suggestions of the original author. The results of the exploratory factor analysis supported the theoretical four-factor structure of HSQ. The confirmatory factor

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analysis showed an acceptable fit with the Chinese samples (GFI = 0.86, AGFI = 0.83, RMSEA= 0.06). The Cronbach alpha reliabilities of Chinese translation of HSQ were 0.81, 0.78, 0.61 and 0.72, respectively for affiliative, self-enhancing, aggressive, and self-defeating humor. The Pearson correlations between coping humor and each dimension of the four humor styles were 0.31***, 0.52***, 0.19** and 0.04 (*** $p < 0.001$, ** $p < 0.01$), respectively for affiliative, self-enhancing, aggressive, and self-defeating humor.

Chen and Martin (2007) found that the four humor styles posited by Martin et al.(2003) also exist in Mainland China, which means that the theoretical framework of HSQ is reasonable in Mainland China. However, Chen and Martin's (2007) study is just an initial validation of the HSQ. Following the scale development procedure (DeVillis, 1991), much more relevant research for the validation of the HSQ in the Chinese context should be done. Chen and Martin's (2007) research findings reveal that there are at least three reasons for further validation of the HSQ in Mainland China. Firstly, the Cronbach alpha of aggressive humor scale for Mainland Chinese was 0.61 (lower than 0.70), which is questionable and needs to be improved (Schmitt, 1996). Secondly, due to probably cultural differences, several items of Chinese translation of the HSQ did not loaded highest on their designated subscales as expected as in Candian samples. Different cultures have different perceptions and behaviors of humor (Chiang-Hanisko et al., 2009). For example, the Chinese and Canadians seemed to have a different understanding of Item 11 ("When telling jokes or saying funny things, I am usually not very concerned about how other people are taking it") and Item 19 ("Sometimes I think of something so funny that I can't stop myself from saying it, even if it is not appropriate for the situation") from the aggressive humor scale. The concept of Chinese tolerance or politeness, including respecting people's face (Liao, 2003), may stop oneself from saying funny things. In general, there is an essential difference in social cognition, emotion, evaluation, belief and other aspects of the socialist political culture in Mainland China (Chen, 2013). Past studies did not address these cultural issues. Finally, only university students were used as respondents in Chen and Martin's (2007) study. Different respondents need to be administered to Chinese translation of the HSQ by following the scale development procedure. Therefore, Chinese translation of the HSQ needs to be further refined for use in Mainland China.

2 Study One: Developing the HSQ in the Chinese Context

2.1 Methods and Procedure

Chen and Martin's (2007) study is an initial validation of the 32-item Humor Styles Questionnaire (Martin et al., 2003) in the Chinese context. The results showed that factors corresponded very closely with the original four scales of the HSQ. However, further item analysis was conducted in this study based on Chen and Martin's (2007) study. The results showed that several items did not perform well. Item 28 on the self-defeating scale, Item 11, 19 and 27 on the aggressive scale did not perform well due to their low factor loadings (item-total correlations below 0.25). In order to further determine if the items were performing well, the researchers applied two criteria found in the scale development literature (DeVillis, 1991). When each item's correlation with its designated scale total was compared with its correlations with the other three humor scale totals, no item was deleted on the criterion that its correlation with the intended scale was less than 0.20 higher than its correlation with the total scores of any of the other three humor scales. The purpose of this step was to minimize the intercorrelations among the four humor scales. An item was selected and retained according to the following criteria: (a) it should load highest on its corresponding factor as expected; (b) the completely standardized factor loadings should be greater than 0.30 (e.g., Singelis, 1994). Item 15 on the aggressive humor scale did not perform well following these criteria. After deleting these five items, 27 items were retained and 8, 8, 4, and 7 items were kept for the final affiliative, self-enhancing, aggressive, and self-defeating humor factor, respectively.

Translation deviations and cultural differences may be the two main reasons for the unexpected items between Canadian and Chinese samples. To increase the number of the item pool, two procedures were conducted. Firstly, the authors of this paper discussed and revised the five deleted items for Chinese respon-

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dents by using the same method adopted by Martin et al. (2003), making them more unambiguously related to their intended factors. Secondly, since empirical studies on humor before Chen and Martin's (2007) study are very seldom and humor is most often described in the Chinese literature, Chinese literature is important for generating and revising the items of HSQ in the Chinese context. The authors tried to find out the understanding of the humorous style in the Chinese literature. For example, the item "When I am frustrated or feeling unhappy, I often use An Q's (the main character in the famous Chinese writer Lu Xun's work 'The True Story of An Q'; Lu, 2005) way of illusionary victory to compose and benumb myself" was added to reflect the well-known use of humor by Chinese to overly self-deprecate.). The construct-based scale construction approach recommended by Jackson (1970) was employed, which reflected the influence of Chinese culture. Finally, an additional 26 new items were generated and added to the item pool. Thus, 53 items in total were obtained in the item pool for the HSQ in Chinese. There were 15, 13, 14, and 11 items for affiliative, affiliative, aggressive, and self-defeating humor, respectively.

The 53-item HSQ in Chinese was administered to a total of 270 participants (156 university students (96 female, 60 male) with an average age of 20.99 years and 114 university teachers (41 female, 73 male) with an average age of 37.44 years). All the participants had a good command of Mandarin. The 156 university students majored in business at Guangdong University of Foreign Studies, Mainland China. The 114 university teachers were from five universities in Guangdong and Fujian Province, Mainland China. The average teaching experience of the participants was 12.34 years. All the participants were voluntary to fill the questionnaire with paper and pencil.

The standard procedure for selecting the HSQ items was the same as Martin et al.'s (2003) study. After item selection, exploratory factor analysis (n=270) was conducted and 25 items were left for the HSQ. The 25-item HSQ was also administered to 388 university teachers (218 female and 170 male; Mean age = 36.73 years, SD = 8.71, Range = 23-66; from Guangdong University of Foreign Studies, mainland China) in paper and pencil. A confirmatory factor analysis (n=388) of the 25-item HSQ were conducted.

2.2 Results

Standard deviations for all items of the HSQ were greater than 1.0 (range from 1.2 to 1.9), indicating adequate item variance across participants. In order to minimize the inter-correlations among the four humor scales, corrected item-total correlations were then examined for each of the four HSQ subscales, and six items were deleted due to correlations below 0.25. When each item's correlation with its designated scale total was compared with its correlations with the other three humor scale totals, five items were deleted.

In order to minimize the overlap of the HSQ four-subscales and increase their discriminant validity, an exploratory factor analysis (n=270) with the maximum likelihood extraction method and oblique rotation with Kaiser Normalization was conducted on the remaining 42 HSQ items. Seven eigenvalues (the first four were 7.11, 4.80, 3.26, and 2.1, and the next three were 1.50, 1.24, and 1.20) were greater than 1. Examination of the scree plot indicated that a four-factor solution was supported. The first four factors accounted for 45.8% of the total variance. In order to illustrate that the four-factor solution was better than other solution, five, six, and seven-factor solutions were also examined with the maximum likelihood extraction method and oblique rotation with Kaiser Normalization, respectively. The results showed that only two items loaded highest on the fifth or sixth factor, while no item loaded highest on the seventh factor. Thus five, six, and seven factor solutions were not supported since there were at least three items loading highest on one factor.

To determine if the items were performing well, the authors applied two criteria found in the scale development literature (De Villis, 1991). An item was selected and retained using the following criteria: (a) it should load highest on its corresponding factor as expected; (b) the completely standardized factor loadings should be greater than 0.40 (e.g., Singelis, 1994). Using these two criteria, seventeen items were deleted. Finally, 25 items were left for the final version of the HSQ. Eight, five, seven, and five items were left for the affiliative, self-enhancing, aggressive, and self-defeating humor factor, respectively. The loading of each item of the HSQ with its designated factor is showed in Table 1.

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Table 1: Items and Varimax-rotated factor loadings of the four scales on the HSQ

Item	Factor	1	2	3	4
Factor 1 Affiliative Humor					
1.I usually don't laugh or joke around much with other people.*		-0.45	-0.02	0.01	-0.01
2.I usually don't like to tell jokes or amuse people.*		-0.53	0.06	0.09	0.06
3.I usually can't think of witty things to say when I'm with other people.*		-0.55	-0.07	-0.11	-0.11
4.I rarely make people laugh by telling a variety of anecdotes.*		-0.57	0.01	-0.14	-0.13
5.I laugh and joke a lot with my closest friends.		0.58	0.05	0.06	-0.06
6.When I usually tell funny things about myself, people seldom laugh.*		-0.50	0.11	0.04	-0.09
7.I enjoy making people laugh.		0.50	0.18	0.03	-0.22
8.I don't have to work very hard at making other people laugh—I seem to be a naturally humorous person.		0.59	0.22	0.14	-0.05
Factor 2 Self-enhancing Humor					
1.If I am feeling depressed, I can usually cheer myself up with humor.		0.18	0.50	0.04	0.02
2.If I am feeling upset or unhappy I usually try to think of something funny about the situation to make myself feel better.		-0.1	0.68	-0.03	0.04
3.If I'm by myself and I'm feeling unhappy, I make an effort to think of something funny to cheer myself up.		0.1	0.78	-0.02	0.03
4.When I'm depressed, I'd like to reminisce about funny things in the past to cheer myself up.		-0.01	0.70	-0.02	-0.08
5.My humorous outlook on life keeps me from getting overly upset or depressed about things.		0.35	0.45	-0.03	-0.05
Factor 3 Aggressive Humor					
1.If someone has faults or shortcomings, I often make fun with him/her.		0.02	-0.05	0.42	-0.12
2.Sometimes I think of something that is so funny that I can't stop myself from saying it, even if it is not appropriate for the situation.		-0.02	-0.04	0.43	-0.1
3.If I don't like someone, I often use humor or teasing to put them down.		0.06	-0.04	0.69	-0.02
4.If someone makes a mistake, I will often tease them about it.		-0.1	0.01	0.72	0.01
5.I often play tricks on others for being funny.		0.2	0.05	0.44	-0.11
6.I often satirize and laugh at people with inferior abilities or low status.		-0.17	0.02	0.42	-0.06
7.If I don't like someone,I often use humor or teasing to put them down.		0.05	-0.03	0.71	0.08

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Item	Factor	1	2	3	4
Factor 4 Self-defeating Humor					
1.I let people laugh at me or make fun at my expense more than I should.*		-0.11	0.02	0.08	-0.52
2.I will often get carried away in putting myself down if it makes my family or friends laugh.*		-0.06	0.01	-0.05	-0.61
3.I often go over board in putting myself down when I am making jokes or trying to be funny.*		-0.09	0.02	0.02	-0.69
4.When I am with friends or family, I often seem to be the one that other people make fun of or joke about.*		0.05	-0.05	0.05	-0.54
5.I often try to make people like or accept me more by saying something funny about my own weaknesses, blunders, or faults.*		0.14	-0.02	0.08	-0.54

In this sample (n=270), the two supposedly beneficial humor styles (namely affiliative humor and self-enhancing humor) were significantly and positively correlated with one another (r = 0.35 for females and r = 0.30 for males, $p < 0.01$), while the two supposedly detrimental humor styles (namely aggressive and self-defeating humor) were significantly and positively correlated with one another (r = 0.34 for females and r = 0.48 for males, $p < 0.01$). The Cronbach alphas were 0.80, 0.83, 0.78, and 0.75 (n = 270) for the affiliative, self-enhancing, aggressive, and self-defeating humor scale, respectively. Details of the correlations between the four HSQ factors are shown in Table 2.

Table 2: Cronbach Alpha Coefficients and Correlations between the Four HSQ Factors (N = 270)

	Affiliative	Self-enhancing	Aggressive	Self-defeating
Affiliative humor	0.80	0.35**	0.10	0.09
Self-enhancing humor	0.30**	0.83	-0.01	-0.09
Aggressive humor	-0.05	-0.14	0.78	0.34**
Self-defeating humor	-0.26**	-0.3	0.48**	0.75

Note.(1)Cronbach alpha coefficients are on the diagonal. Correlations for females (n = 137) are above the diagonal, for males (n = 133) below the diagonal.

(2) * $p < 0.05$, ** $p < 0.01$.

A confirmatory factor analysis using maximum likelihood estimation was conducted with the 25 items on the data from the teacher participants (n=388), which was heterogeneous from university students. A four-factor model was tested, with the four scales as latent variables and their corresponding items as indicators for each latent variable. The four latent variables were allowed to covary. According to Anderson et al. (2001), a fairly good degree of fit requires GFI> 0.90, AGFI> 0.80, RMSEA <0.05 or 0.08. The results indicated a moderately good fit to the observed data ($\chi 2 = 1139.4$, df = 498; RMSEA = 0.07, GFI = 0.89, CFI = 0.83, AGFI = 0.84).

The 25-item HSQ was also administered to 318 university students (117 female and 201 male) (Zhang et al., 2009). An exploratory factor analysis on the 25 items was conducted with maximum likelihood estimation and oblique rotation method. Results showed that the four-factor model solution was optimal. A confirmatory factor analysis was conducted with 168 participants randomly selected from the 318 university students. The results indicated a moderately good fit to the observed data ($\chi 2=869.33$, df=269, GFI=0.85, AGFI=0.81, RMSEA=0.07, NFI=0.76, NNFI=0.80, CFI=0.82). Also, the internal consistency coefficients (Cronbach alphas) seems good (0.72, 0.71, 0.88, and 0.76 for affiliative, self-enhancing, aggressive, and self-defeating humor, respectively).

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3 Study Two: Further Examining the Validity and Reliability of the HSQ

According to the previous findings on relations of the humor styles with health and personality (e.g., Martin et al., 2003; Saroglou & Scariot, 2002; Chen & Martin, 2007; Chan et al., 2011; Ruch & Heintz, 2013, 2017), it is hypothesized that affiliative humor and self-enhancing humor are positively related to those variables with positive values, while they are negatively related to other variables with negative values. It is also hypothesized that aggressive humor and self-defeating humor are positively related to those variables with negative values, while they are negatively related to other variables with positive values. These hypothesis were examined in Study Two. The Cronbach alphas and test-retest reliabilities of the 25-item HSQ four factors were also examined in Study Two. Study Two consists of the 10 sub-studies as indicated in the following methods and procedure.

3.1 Methods and Procedure

Sub-study 1: Together with the 25-item HSQ in Chinese, a Chinese version of the NEO-Five-Factor Inventory (Costa & McCrae, 1992; Zhang & Huang, 2001) was also administered to the 388 university teachers. Containing 60 items, the NEO-Five-Factor Inventory is viewed as a brief and comprehensive measure of the five personality dimensions. The Cronbach alpha coefficients reported in the previous study (Zhang & Huang, 2001) were 0.75, 0.65, 0.56, 0.70, and 0.71 for neuroticism, extraversion, openness, agreeableness, and conscientiousness, respectively. Pearson correlation coefficients between the four humor styles and the Big Five personality traits were calculated.

Sub-study 2: In order to examine the test-retest reliability of the 25-item HSQ in Chinese, 104 university students (38 male and 66 female) were administered to the 25-item HSQ in Chinese twice. The interval of the two tests was two weeks.

After the paper publication of Chen and Martin's (2007) study, several Mainland Chinese scholars asked the second author of this paper to use the 25-item HSQ in Chinese. Thus, the 25-item HSQ and a number of additional measures were administered to several different samples of Chinese participants such as primary and high school teachers, high school students, nurses, and cancer patients.

Sub-study 3: The 36-item Experiences in Close Relationship Inventory (Li & Kato, 2006), Beck Depression Inventory-II (Yang et al., 2012) and the 25-item HSQ in Chinese were administered to 414 university students (207 female and 207 male) (He et al., 2015). The Cronbach alpha coefficients were 0.75 and 0.91 for attachment anxiety and attachment avoidance of the Experiences in Close Relationship Inventory, respectively.

Sub-study 4: A sample of 100 cancer patients were administered to the Numeric Pain Rating Scale (Flaherty, 1996) and the 25-item HSQ in Chinese (Liu, Zhang & Xiong, 2020).

Sub-study 5: 263 teachers (90 primary school teachers and 173 high school teachers) were administered to the 25-item HSQ in Chinese.

Sub-study 6: 268 vocational students were administered to the General Health Questionnaire (Li & Wei, 2007) and the 25-item HSQ in Chinese(Wu, Xu, & Lan, 2015).

Sub-study 7: 1229 university students (734 female and 495 male) completed the 15-item Interaction Anxiousness Scale (Leary, 1983) and the 25-item HSQ in Chinese (Zhu, 2015).

Sub-study 8: 347 university students (216 female and 131 male) completed the 33-item Emotional Intelligence Scale (Schnutte et al., 1998), the 40-item Interpersonal Communication Competency Questionnaire (Wei, 2005) and the 25-item HSQ in Chinese (Wang & Zhang, 2014).

Sub-study 9: 286 university students (155 female and 131 male) completed the Coping Style Questionnaire (Xiao & Xu, 1996) and the 25-item HSQ in Chinese (Xiao, 2009). The scale consisted of six sub-

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scales: Problem-solving, Self-blame, Asking for assistance, Illusion, Avoidance, and Rationalization. The test-retest reliabilities for these six subscales of the Coping Style Questionnare ranged from 0.62 to 0.73.

Sub-study 10: A sample of 342 university students (188 female and 153 male) also completed the Loneliness Scale (Russell, 1996) and the 25-item HSQ in Chinese (Sun et al., 2009). The Cronbach alpha for the Loneliness Scale was 0.94.

Sub-study 11: A sample of 318 university students (117 female and 201 male) was administered to the EPQ-R Short Scale (Qian et al., 2000) and the 25-item HSQ in Chinese (Zhang et al., 2009). The Cronbach alpha coefficients were 0.72, 0.85, and 0.74 for Psychoticism, Extroversion, and Neuroticism, respectively.

The correlation coefficients between four humor styles and the above-mentioned measures from Sub-study 6 to 11 were calculated.

3.2 Results

Correlations between humor styles and Big-Five personality traits

Details of the results of the Pearson correlations between humor styles and the Big-Five personality traits are shown in Table 3. As expected, neuroticism was significantly and negatively related to the two potentially beneficial humor styles (affiliative and self-enhancing humor), while it had significantly positive correlations with the two potentially detrimental humor styles (aggressive and self-defeating humor). Extraversion was significantly and positively related to affiliative, self-enhancing, and self-defeating humor. Openness to experience was significantly and positively related to affiliative humor. Agreeableness and conscientiousness were significantly and positively related to self-enhancing humor, and significantly and negatively related to aggressive and self-defeating humor. The above results were consistent with Saroglou and Scarriot's (2002) and Martin et al.'s (2003) findings.

Table 3Correlations between Humor Styles and the Big Five Personality Traits (n = 388)

Trait/Humor Style	Affiliative humor	Self-enhancing humor	Aggressive humor	Self-defeating humor
Neuroticism	-0.14**	-0.28***	0.17**	0.14**
Extraversion	0.37***	0.42**	0.04	0.13*
Openness to Experience	0.22***	0.09	0.07	0.02
Agreeableness	0.08	0.12*	-0.45***	-0.18***
Conscientiousness	0.09	0.23***	-0.12**	-0.10*

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

3.3 Test-retest Reliabilities and Cronbach Alpha Coefficients of the Four Humor Styles

In Sub-study 2 with university students, the test-retest reliabilities were 0.86, 0.82, 0.71, and 0.77 (all $p < 0.01$) for affiliative, self-enhancing, aggressive, and self-defeating humor, respectively.

The Cronbach alpha coefficients of the four humor styles were reported in Sub-study 3, 4, and 5. In Sub-study 3 with university students, the Cronbach alpha coefficients were 0.82, 0.76, 0.82, and 0.75 for affiliative, self-enhancing, aggressive, and self-defeating humor, respectively. In Sub-study 4 with cancer patients, the Cronbach alpha coefficients were 0.81, 0.78, 0.61, and 0.72 for affiliative, self-enhancing, aggressive, and self-defeating humor, respectively. In Sub-study 5 with primary and high school teachers, the Cronbach alpha coefficients were 0.63, 0.70, 0.79, and 0.68 for affiliative, self-enhancing, aggressive, and self-defeating humor, respectively.

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3.4 Correlations between humor styles and other measures

Generally as expected, the two potentially beneficial humor styles (affiliative humor and self-enhancing humor) were significantly and positively correlated with apperceive sentiment, self-control sentiment, emotional management of others, emotional use, interpersonal skills, problem solving, asking for assistance and extraversion, while they were significantly and negatively correlated with negative value variables including attachment anxiety, attachment avoidance, depression, interaction anxiousness, self-blame, loneliness, psychoticism and neuroticism. The two potentially maladaptive humor styles (aggressive humor and self-defeating humor) were significantly and positively correlated with attachment anxiety, depression, interaction anxiousness, self-blame, illusion, loneness, psychoticism and neuroticism, while they were significantly and negatively correlated with self-control sentiment, emotional management of others and emotional use. The detailed results of correlation analysis between the four HSQ scales and each of the other variables were shown in Table 4.

Table 4 Correlations between the four HSQ factors and other measures

	Affiliative	Self-enhancing	Aggressive	Self-defeating humor
Mental health [(a)]	0.221**	0.069*	-0.301**	-0.129**
Attachment anxiety [(b)]	-0.180**	-0.325**	0.402**	0.339**
Attachment avoidance[(b)]	-0.326**	-0.207**	0.225**	0.063
Depression[(b)]	-0.200**	-0.402**	0.264**	0.334**
Interaction anxiousness[(c)]	-0.352**	-0.059*	0.293**	0.257**
Apperceive sentiment[(d)]	0.115**	0.116*	-0.011	-0.055
Self-control sentiment[(d)]	0.217**	0.404**	-0.196**	-0.127**
Emotional management of Others[(d)]	0.308**	0.323**	-0.244**	-0.105*
Emotional use[(d)]	0.234**	0.214**	-0.192*	-0.133*
Interpersonal skills [(d)]	0.287**	0.123*	-0.152**	-0.045
Problem solving[(e)]	0.35**	0.42**	-0.10	-0.11
Self-blame[(e)]	-0.13*	-0.20**	0.24**	0.27**
Asking for assistance[(e)]	0.38**	0.25**	-0.09	-0.09
Illusion [(e)]	-0.08	0.03	0.19**	0.20**
Avoidance[(e)]	0.01	-0.05	0.05	0.23**
Rationalization[(e)]	-0.07	-0.11	0.09	0.22**
Loneliness [(f)]	-0.446**	-0.472**	0.316**	0.261**
Psychoticism[(g)]	-0.207***	-0.139*	0.486***	0.402***
Extraversion[(g)]	0.403***	0.322***	-0.155**	-0.055
Neuroticism[(g)]	-0.239***	-0.253***	0.301***	0.264***

Note. Mental health is the total score of the general health scale. Attachment anxiety and Attachment avoidance are two dimensions of Experiences in Close Relationship Inventory; Apperceive sentiment, Self-control sentiment, Emotional management of others and Emotional use are factors for Emotional Intelligence Scale; Problem-solving, Self-blame, Asking for assistance, Illusion, Avoidance and Rationalization are six factors for Coping Style Questionnaire; Psychoticism, Extraversion and Neuroticism are three dimensions for EPQ-R short Scale.

n(a)=268, n(b)=414, n(c)=1229, n(d)=347, n(e)=286, n(f)=342, n(g)=318.

*p < 0.05, **p < 0.01, ***p < 0.001.

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3.5 Discussion

The present research aimed at further developing the Chinese translation of the HSQ (Chen & Martin, 2007) and improving its psychometric properties. The aim of this research was achieved as follows.

Firstly, after new item generation and item analysis, the results of an EFA also supported a four factor structure of the HSQ in the Chinese context. A total of 25 items were left for the Chinese HSQ (8, 5, 7 and 5 items for affiliative, affiliative, aggressive, and self-defeating humor, respectively). In the 25-item Chinese HSQ, 19 items were from Chinese translations of the original HSQ's items, while 6 items were different from the original HSQ's items. Although the item number (25) of the Chinese HSQ was less than 32 of the HSQ (Martin et al., 2003), the item number (at least 5) for each subscale of the HSQ was still appropriate (DeVillis, 1991). The interrelations between the four subscales of the Chinese HSQ were consistent with Martin et al.'s (2003) theoretical assumption and findings. The results showed that the two potentially beneficial humor styles (Affiliative humor and Self-enhancing humor) were significantly and positively related while the two potiential detrimental humor styles (Aggressive humor and Self-defeating humor) were significantly and positively related. Other interrelations between the four subscales of the Chinese HSQ indicated that the four subscales were not fully separated. The results of relations between coping humor (CHS; Martin & Lefcourt, 1983) and each of the four humor styles were consistent with Martin et al.'s (2003) findings, supporting the construct validity of the Chinese HSQ.

Secondly, the results of a CFA on the Chinese HSQ (n=388) supported a moderately good fit to the observed data. The results of another CFA on the Chinese HSQ (n=168; Zhang et al., 2009) also supported a moderately good fit to the observed data. The Cronbach alphas of the 25-item Chinese HSQ (0.80, 0.83, 0.78, and 0.75 for affiliative, self-enhancing, aggressive, and self-defeating humor scale, respectively; n=270) were generally better than those of Chinese translation of HSQ (Chen & Martin, 2007; 0.81, 0.78, 0.61 and 0.72, respectively for affiliative, self-enhancing, aggressive and self-defeating humor; n=354). The Cronbach alphas of the 25-item Chinese HSQ were quite close to those in Martin et al.'s (2003) (n=1195; 0.80, 0.81, 0.77 and 0.80 respectively for affiliative, self-enhancing, aggressive and self-defeating humor). This indicated a good improvement in Cronbach alpha for aggressive humor, which was also supported by the results of Zhang et al.'s research (2009; Cronbach alpha = 0.88 for aggressive humor). The test-retest reliabilities (0.86, 0.82, 0.71, and 0.77 for affiliative, self-enhancing, aggressive, and self-defeating humor, respectively) also support the good psychological properties of the 25-item Chinese HSQ.

Thirdly, since the four humor styles are most relevant to psychosocial well-being (Martin et al., 2003), it seems appropriate to examine the criterion validity of the Chinese HSQ scales with other measures which are related to health and psychosocial well-being. Generally as expected, the results of Study Two contributed to the current literature on relations between humor styles and other variables such as Big-Five personality traits, apperceive sentiment, self-control sentiment, emotional management of others, emotional use, interpersonal skills, problem solving, asking for assistance, self-blame, illusion, avoidance, rationalization, loneliness, psychoticism, extraversion, and neuroticism. For example, correlations between humor styles and Big-Five personality traits were generally as expected. The finding that agreeableness was significantly and positively related to self-enhancing humor is consistent with Saroglou and Scariot's (2002) findings, while the finding that conscientiousness was significantly and positively related to self-enhancing humor was consistent with Martin et al.'s (2003) findings. Overall, the results on the relations of the Chinese HSQ four humor styles with psychological health and personality supported the criterion validity of the Chinese HSQ scales. It is concluded that the Chinese HSQ with appropriate psychological properties can be utilized in Mainland China.

Finally, cultural differences are addressed in the item understanding of the 25-item Chinese HSQ. For example, it was found that the item ("I often play tricks on others for being funny.") on the aggressive humor in the 25-item Chinese HSQ is quite different from the original Martin et al.'s (2003) HSQ scale. In Chinese daily life and informal occasions, it's quite a few to play tricks on others for being funny. It was also found

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that the item ("I often satirize and laugh at people with inferior abilities or low status.") on the aggressive humor in the 25-item Chinese HSQ is quite different from the original Martin et al.'s (2003) HSQ scale. This item reflects the power orientation ideology and social estate/class system in the traditional Chinese culture.

There were at least three limitations of this research that should be noted. Firstly, the item loadings of the 25-item HSQ varied from 0.42 to 0.78 and a good factor loading is suggested to be greater than 0.50 (McDonald, 1985), indicating that there is still room for the Chinese HSQ scale refinement. Future research could address this issue and replace these lower factor-loading items with new appropriate items. Secondly, the present research relied mainly on self-report measures, which may have the potential effect on methodological artifacts, such as common method variance (Kline et al., 2000). It is suggested that other research methods such as observation and other rating measures be used in future research to achieve more objective and accurate results. Finally, due to intracultural differences, it should be cautious of employing this 25-item Chinese HSQ in Great China areas (such as Taiwan, Hongkong, and Macao) other than Mainland China.

ETHICS STATEMENT

The research was carried out with written informed consents from all subjects in accordance with the professional ethics for psychological testers and codes of ethics for clinical and advisory work by Chinese Psychological Society. All subjects were given written informed consents in accordance with the Declaration of Helsinki.

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