Nation-Level Moderators of the Extent to Which Self-Efficacy and Relationship Harmony Predict Students' Depression and Life Satisfaction: Evidence From 10 Cultures

Peter B. Smith[1], Abd Halim Ahmad[2], Ellinor Owe[1], Göksu Cagil Celikkol[3], Hu Ping[4], Alin Gavreliuc[5], Phatthanakit Chobthamkit[6], Muhammad Rizwan[7], Sylvia Xiaohua Chen[8], Hui Bee Teh[9], and Vivian L. Vignoles[1]

Abstract

Previous two-nation comparisons have provided evidence that self-efficacy may be a protective factor against depression in individualist cultures, whereas relationship harmony may be a stronger protective factor in collectivist cultures. However, wider sampling and more specific measures of cultural difference are required to test these conclusions. Student ratings of depression and life satisfaction were surveyed in 10 samples drawn from nine nations. Culture-level individualism positively moderated the relationship of self-efficacy to low depression. However, culture-level collectivism negatively moderated the linkage of relationship harmony to depression. To better understand these effects, four separate nation-level predictors derived from dimensions of self-construal were employed. Effects of self-efficacy were strongest where cultural models of selfhood emphasized self-direction (vs. receptiveness to influence); effects of relationship harmony were strongest where cultural models of selfhood emphasized dependence on others (vs. self-reliance). These results illustrate the value of unpacking the diffusely defined concept of individualism-collectivism.

Keywords

clinical/abnormal, emotion, interpersonal relationships

[1]University of Sussex, Brighton, UK
[2]University of North Malaysia, Sintok, Malaysia
[3]University of Helsinki, Finland
[4]Renmin University of China, Beijing, China
[5]West University of Timisoara, Romania
[6]Thammasat University, Bangkok, Thailand
[7]University of Karachi, Pakistan
[8]Hong Kong Polytechnic University, Hong Kong
[9]Klinik Pakar Au Tong, Subang Jaya, Selangor, Malaysia

Corresponding Author:
Peter B. Smith, University of Sussex, Falmer, Brighton BN19QG, UK.
Email: psmith@sussex.ac.uk

Research by cross-cultural psychologists has been strongly influenced by the concept of nation-level individualism-collectivism (Hofstede, 2001; Triandis, 1995) and has frequently drawn upon this concept in interpreting differing results obtained from two-nation comparisons. In the present investigation, we take one such published study and seek to show how a fuller understanding of the issues upon which it focused can be obtained by wider sampling and through the use of measures that decompose the diffuse and multi-layered concept of individualism-collectivism. The study in question compared predictors of adolescent depression within Hong Kong and the United States (Chen, Chan, Bond, & Stewart, 2006).

Chen et al. (2006) hypothesized that within the individualistic culture of the United States, persons with high self-efficacy would be less prone to depression, whereas in collectivistic Hong Kong, persons with high relationship harmony would be less vulnerable to depression. They found that high self-efficacy and high relationship harmony were both significant predictors of lower depression in both samples. As hypothesized, self-efficacy was a stronger predictor in the United States, but the hypothesis that relationship harmony would be a stronger predictor of low depression in Hong Kong was not supported. Chen and colleagues' hypotheses were based on discussion of Hofstede's (2001) dimension of individualism, and the expectation that members of individualistic and collectivistic cultures will differ in their propensity to be characterized by different levels of independent and interdependent self-construals (Markus & Kitayama, 1991). However, no measures of these concepts were included. Thus, the study yielded no evidence as to whether the differences that were found were attributable to these dimensions of culture or to other ways in which the cultural contexts of Hong Kong and U.S. adolescents differ. For instance, as Chen et al. noted, samples from Hong Kong and the United States differ in terms of relevant dimensions of the values surveyed by Schwartz (1994). Another possibility is that depressive symptoms may differ between the two groups. To gain a fuller picture of cultural factors associated with depression, wider sampling is required. It is also desirable to include measures that tap individualism-collectivism and its hypothesized components, as well as alternative indicators of well-being.

Culture and Depression

Discussion of the comparative incidence of depression across cultures has been focused around the likelihood that cultural norms will influence the ways in which symptoms are expressed (Kleinman, 2004). In East Asian cultures, emotional display rules favor expression of harmony and disfavor strong expressions of emotion (Matsumoto et al., 2008). Consequently, it has been found in early studies that there is a stronger tendency for depression to be expressed by way of complaints about somatic symptoms rather than through overt emotion, particularly in China (Marsella, Sartorius, Jablensky, & Fenton, 1985). However, these conclusions are based on reported symptom frequencies within single-nation samples. In one of the few published comparative studies that have tested for scalar measurement invariance, Zhang et al. (2011) found no tendency for a Chinese elderly sample to report somatic symptoms more frequently than a Dutch elderly sample. The Dutch scored higher on all four of the subscales of the Center for Epidemiological Studies–Depression (CES-D) scale. Further studies support the view that CES-D scores can be validly compared across cultures. For instance, an eight-item version of the CES-D showed partial scalar invariance across representative samples in 23 European nations (Van de Velde, Bracke, & Levecque, 2010; Van de Velde, Bracke, Levecque, & Meuleman, 2010). Mak, Bond, Simpson, and Rholes (2010) found metric equivalence of CES-D items between Hong Kong and U.S. respondents.

In their study, Chen et al. (2006) used the Beck Depression Inventory, finding high reliability for the overall scale in both Hong Kong and the United States. No mean subscale scores were reported by them or by another report drawing on the same data (Stewart et al., 2005). Although

sparse, the evidence suggests that it is appropriate to survey depression across cultures using a single overall index. In his initial report on the CES-D scale within the United States, Radloff (1977) noted that while the scale can yield four separate factors, these together yield a single second-order factor, and he suggested using a single total score.

Culture and Life Satisfaction

To test the generality of results beyond an exclusive focus on depressive symptoms, an alternative measure of well-being was included in the present study. Life satisfaction was selected because there is an extensive literature indicating that variations in life satisfaction are associated with nation-level differences in individualism-collectivism. Initial studies found a significant correlation between individualism and nation-level means for life satisfaction in 55 nations (Diener & Diener, 1995; Diener, Diener, & Diener, 1995). A more recent meta-analysis of numerous studies has indicated that individualism remains a significant predictor of nation-level life satisfaction and related measures of subjective well-being even when the effect of other variables such as wealth that also correlate with life satisfaction are partialled out (Fischer & Boer, 2011). While Diener and his colleagues used Hofstede's (2001) scores and country estimates provided by Triandis for individualism-collectivism as their predictors, Fischer and Boer constructed a conglomerate index from existing cross-national data sources.

Studies have also shown that nation-level individualism acts as moderator of the relationship between individual-level attributes such as self-esteem and life satisfaction (Oishi, Diener, Lucas, & Suh, 1999). From this perspective, nations vary in the types of needs that are associated with high or low life satisfaction. Across 39 nations, Oishi et al. (1999) found self-esteem to be a stronger predictor of the five-item Satisfaction With Life Scale (SWLS) in more individualist nations. This perspective was extended by Kwan, Bond, and Singelis (1997) who proposed that relationship harmony would be a stronger source of life satisfaction in collectivist cultural contexts than in individualist contexts, while self-esteem would show the reverse pattern. These predictions were supported using student samples in Hong Kong and the United States. Kwan et al. (1997) also showed that the relationship between independent self-construal and SWLS was mediated by self-efficacy, whereas the relationship between interdependent self-construal and SWLS was mediated by relationship harmony, using Singelis's (1994) measure of self-construal. There was no significant difference between the strength of these mediation effects in Hong Kong and the United States. Thus, we have some evidence of an individual-level linkage between self-construal and SWLS, but wider sampling is required to test for any nation-level moderation effect of the type proposed by Oishi et al.

Unpackaging Individualism-Collectivism

In the studies reviewed in the preceding sections, individualism-collectivism has been treated as a unitary dimension of cultural difference. However, researchers have defined the concept in a multiplicity of ways, and it is better thought of as a syndrome entailing the variations in beliefs, attitudes, values, goals, and norms that prevail within a given context (Triandis, 1995). The related concepts of independent and interdependent conceptions of self-construals advanced by Markus and Kitayama (1991) offer greater precision and have been widely seen as encapsulating a key aspect of cultural differences, particularly those between North America and East Asia. However, the most widely employed individual-level measure of their concepts (Singelis, 1994) has also included items referring to self-construal, values, goals, and behaviors. In more recent publications, Kitayama, Park, Sevincer, Karasawa, and Uskul (2009) and Markus and Kitayama (2010) have emphasized that they understand independence and interdependence not simply as attributes of individuals but as implicit aspects of cultures, to which specific individuals may be

expected to react in diverse ways (see also Kitayama & Uskul, 2011; Smith, Fischer, Vignoles, & Bond, 2013). Indeed, these authors anticipate that a person's cultural context will be a stronger predictor of psychological functioning than will be his or her individual-level orientations toward independence or interdependence. Thus, we suggest that it is the differential adaptiveness of self-efficacy and relationship harmony to different kinds of cultural context, rather than their consistency or otherwise with individuals' personal ways of construing themselves, that should moderate their importance as predictors of psychological well-being.

This conceptualization of culture is consistent with the perspective adopted in the previously discussed studies by Chen et al. (2006) and Kwan et al. (1997) and also forms the basis of the present study. A project using this perspective requires culture-level measures reflecting the predominant local modes of self-construal. Given that the self-concept is an individual-level construct, characterizing cultures along self-construal dimensions may seem a strange idea. Nonetheless, we consider that individuals' self-construals are grounded in partially shared social constructions of selfhood, which are created and maintained through ongoing interactions within any particular cultural context (Berger & Luckmann, 1966; Kitayama & Uskul, 2011; Markus & Kitayama, 2010; Moscovici, 1988). Representations of the self will not be uniform within cultures, and there will be substantial variance within any given cultural context. Despite this, systematic culture-level variation in models of selfhood can be detected (Vignoles et al., in press), and we suggest that different cultural models of selfhood will have meaningful consequences for the differential associations of self-efficacy and relationship harmony with psychological well-being.

By extensive revision of earlier measures, Vignoles et al. (in press; Owe, 2012) have developed and validated individual- and culture-level measures distinguishing seven dimensions of self-construal, each of which represents an aspect of the overarching distinction between independence and interdependence. Each of these scales includes reverse-keyed items, addressing the problem of acquiescent responding that has been a substantial threat to the validity of prior scales such as that of Singelis (1994). Vignoles et al. (in press) tested their model across 55 cultural groups from 33 nations. Multi-level modeling showed that their seven-factor solution was configurally invariant across individual- and culture-level analyses. Thus, it becomes possible to characterize the prevailing models of selfhood in different cultures using the same seven dimensions. Furthermore, they presented evidence that this culture-level characterization cannot be reduced to a simple second-order contrast between independence and interdependence. The seven factors should therefore be considered as separate constructs.

In the present study, four of these dimensions were selected for inclusion on the basis that they refer to interpersonal models of selfhood that are likely to have greater relevance to the incidence of depression. These were (a) self-direction versus receptiveness to others, (b) self-reliance versus dependence on others, (c) self-containment versus connection to others, and (d) self-interest versus commitment to others. Availability of specific measures makes it possible to test whether they can account more precisely than individualism-collectivism for variations in the extent to which self-efficacy and relationship harmony can predict incidence of depression and life satisfaction. Conceptually, the first named pole of each scale listed above falls within the range of attributes defining independence, whereas the second named pole falls within the range of attributes defining interdependence.

In the larger set of samples now available, the individual-level hypotheses first formulated by Chen et al. (2006) can be retested at the culture level, first in terms of global individualism-collectivism, and then in terms of more specific cultural models of selfhood:

Hypothesis 1 (H1): The individual-level correlation of self-efficacy with low depression will be moderated positively by (a) high individualism, (b) high self-direction, (c) high self-reliance, (d) high self-containment, and (e) high self-interest.

Hypothesis 2 (H2): The individual-level correlation of relationship harmony with low depression will be moderated positively by (a) high collectivism, (b) high receptiveness to influence, (c) high dependence on others, (d) high connection to others, and (e) high commitment to others.

In a similar way, the individual-level hypotheses first tested by Kwan et al. (1997) can be reformulated at the nation level as follows:

Hypothesis 3 (H3): The individual-level correlation of self-efficacy with high life satisfaction will be moderated positively by (a) high individualism, (b) high self-direction, (c) high self-reliance, (d) high self-containment, and (e) high self-interest.

Hypothesis 4 (H4): The individual-level correlation of relationship harmony with high life satisfaction will be moderated positively by (a) high collectivism, (b) high receptiveness to influence, (c) high dependence on others, (d) high connection to others, and (e) high commitment to others.

Method

Sample

Data were collected from 10 samples, two of which are typically considered to be individualistic and eight of which are considered to be collectivistic. The broader sampling of collectivistic samples reflects the greater diversity of collectivistic nations (e.g., House, Hanges, Javidan, Dorfman, & Gupta, 2004), featuring samples from East Asia, Southeast Asia, South Asia, the Middle East, and Eastern Europe. Table 1 shows details of the respondents who were students majoring in a variety of subjects. In most cases, they were enrolled in universities in the cities where the authors are located, but the Turkish data were obtained from two universities in Izmir, while the Finnish data were obtained from Turku University. The questionnaire was created in English, and then translated into the language of instruction in the sampled universities, using back translation (Van de Vijver & Leung, 1997) to maximize accuracy. Responses from non-nationals and those born outside the country were discarded. The Malay Chinese and Finnish samples were substantially lesser than the remaining samples but were well within the limits shown by simulation studies (Wolf, Harrington, Clark, & Miller, 2013) to be required for valid conduct of the confirmatory factor analyses (CFAs) that are reported below.

Measures

To test the hypotheses validly, measurement invariance is desirable: Partial or full *metric equivalence* (i.e., equivalence of item loadings) permits the comparison of within-culture relationships across cultural groups, whereas partial or full *scalar invariance* (i.e., invariance of item loadings and intercepts) permits the cross-cultural comparison of mean levels of a construct. For each scale, model fit was assessed using the comparative fit index (CFI), root mean square error of approximation (RMSEA), and standard root mean squared residual (SRMR). Values of SRMR < .08 (or <.10), RMSEA < .06 (or <.08), and CFI > .95 (or >.90) have been proposed as criteria for "good" (or "acceptable") fit (Hu & Bentler, 1999; Kline, 2005). Following Little (2000), metric or scalar invariance was considered to be supported if a model that assumes that level of invariance showed acceptable fit. Analyses were conducted in Mplus version 6 (Muthén & Muthén, 2010).

Depression. Depression was measured with the 20-item version of the CES-D (Radloff, 1977) scale. These items have 4-point response scales keyed in terms of frequency of symptom

Table 1. Sample Details With Adjusted Means for All Measures.

Group	n	M_{age} (SD)	% female	Language used	SD	SR	SC	SI	SE	RH	CES-D	LS	IC
British	177	18.8 (3.0)	71	English	.007	.025	.004	-.019	.019	-.001	.002	.021	89
Chinese	374	18.5 (0.9)	60	Chinese	-.568	.638	-1.86	.266	-.150	.409	-.160	-.252	20
Finns	118	25.5 (5.4)	75	Finnish	.606	-.159	.291	-.403	-.013	-.080	-.185	.521	63
Hong Kongers	145	20.7 (2.1)	69	Chinese	-.272	.320	-.66	-.018	-.251	.040	-.073	-.284	25
Malay Chinese	99	22.8 (1.1)	44	Bahasa	-.456	.106	-.755	-.286	.016	.559	-.042	.389	26
Malay Malays	287	22.9 (1.4)	52	Bahasa	-.832	.072	-1.52	-.217	.042	.509	-.020	.664	26
Pakistanis	250	25.4 (5.5)	48	Urdu	-.467	.783	-.432	-.100	-.021	.022	.131	.114	14
Romanians	418	22.0 (3.5)	71	Romanian	.050	.754	-.622	.708	.265	.290	-.028	.320	30
Thais	448	20.1 (1.3)	71	Thai	-.400	.082	-1.03	-.333	.051	.287	-.154	.298	20
Turks	372	21.1 (2.5)	54	Turkish	-.225	.883	-1.21	.594	.002	.195	-.008	.201	37

Note. Covariates for SE, RH, CES-D, LS, and self-construals: Age and gender. SD = self-direction; SR = self-reliance; SC = self-containment; SI = self-interest; SE = self-efficacy; RH = relationship harmony; CES-D = Center for Epidemiological Studies–Depression; LS = life satisfaction; IC = individualism-collectivism.

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occurrence. Four items describing positive symptoms are reverse keyed. The scale has been used among many cultural groups, and partial scalar invariance across samples has been established in some studies (e.g., Zhang et al., 2011). The average Cronbach's alpha for CES-D by nation was .88, with no sample scoring below 0.84. Preliminary analysis indicated that it was desirable to omit four items. Item 7 ("I felt that everything that I did was an effort") was discarded because effort has distinctive positive value in East Asian cultures (Hau & Ho, 2010). Item 9 ("I thought my life had been a failure") was discarded because cultural context is known to influence how individuals respond to success and failure (Heine et al., 2001). Item 15 ("People were unfriendly") was discarded because it refers to others rather than to the respondent. Item 20 ("I could not get going") was discarded because of the difficulty of obtaining adequate translation of idiomatic phrases. As this scale includes reversed items, it was possible to compute a separate method factor modeling acquiescence, which loaded onto every indicator at a fixed value of 1 and was not allowed to correlate with the substantive factor (Welkenhuysen-Gybels, Billiet, & Cambré, 2003). The substantive factor was scaled by fixing one item loading to 1. After adding a covariance between two adjacent similarly worded items, a multi-group CFA reflecting full metric and partial scalar invariance had acceptable fit: $\chi^2(1245) = 2{,}538.147$, $p < .001$, CFI = .901, RMSEA = .062, and SRMR = .079. In this model, all loadings and a majority of intercepts were invariant; however, 36 (of a possible 126) intercepts were freed for specific samples, so that between-culture variation would not be confounded by those items that showed idiosyncratic intercepts in particular cultures. Factor scores were saved from this model for use in our main analyses.

Satisfaction with life. Satisfaction with life was measured with the five-item scale developed by Diener, Emmons, Larsen, and Griffin (1985). A sample item is "I am satisfied with life." These items have 7-point response scales keyed from *strongly disagree to strongly agree*. There are no reversed items. The scale has been shown to have predictive validity when used cross-culturally (Diener, Inglehart, & Tay, 2013) but does not always factor unidimensionally (Slocum-Gori, Zumbo, Michalos, & Diener, 2009). The average of Cronbach's alphas for satisfaction with life by nation was .81 with the lowest score being .68. CFA indicated the desirability of dropping Item 2 ("The conditions of my life are excellent"). A multi-group CFA of the remaining four items involving full metric and partial scalar invariance showed marginally acceptable fit: $\chi^2(67) = 196.789$, $p < .001$, CFI = .956, RMSEA = .086, SRMR = .069. In this model, all loadings and a majority of intercepts were invariant; however, seven (of a possible 27) intercepts were freed for specific samples, so that between-culture variance would not be confounded by items showing idiosyncratic intercepts in particular cultures. Factor scores were saved for use in our main analyses.

Self-efficacy. The 10-item General Self-Efficacy (GSE) scale (Schwarzer & Jerusalem, 1995) was used to assess perceived beliefs about the ability to achieve goals and manage the environment. A sample item is "I can solve most problems if I invest the necessary effort." Items have 4-point response scales keyed from *not at all true* to *exactly true*. The scale has been frequently found valid when used cross-culturally (e.g., Chen et al., 2006; Luszczynska, Scholz, & Schwarzer, 2005). The average of Cronbach's alphas by nation was .85, with the lowest score being .79. We removed one item (Item 3: "It is easy for me to stick to my aims and accomplish my goals") based on preliminary analyses and because of its complex sentence structure and double-barreled meaning. In addition, two adjacent items with a similar meaning were permitted to covary. A multi-group CFA reflecting full metric and partial scalar invariance showed acceptable fit: $\chi^2(383) = 1{,}030.882$, $p < .001$, CFI = .917, RMSEA = .080, SRMR = .082. Here, all loadings and a majority of intercepts were invariant; however, 21 (of a possible 72) intercepts were freed for specific samples, so that between-culture variance would not be

confounded by items showing idiosyncratic intercepts in particular cultures. Factor scores were saved from this model.

Relationship harmony. Relationship harmony was measured with the items developed by Kwan et al. (1997). Respondents are asked to select the five most important current relationships in their life. The degree of harmony in each relationship is rated on 7-point scales keyed from *very low* to *very high*. The average Cronbach's alpha for relationship harmony by nation was .65, ranging from .46 (Hong Kong) to .79 (Malay Chinese). The average alpha value is similar to that obtained by Chen et al. (2006). Despite this indication of some variation in levels of harmony between relationships, after within-group standardization a pan-cultural factor analysis did yield a single factor, which explained 42% of variance. Moreover, a multi-group CFA with full metric and full scalar invariance showed acceptable fit: $\chi^2(82) = 210.078$, $p < .001$, CFI = .931, RMSEA = .077, SRMR = .083. In this model, error covariances were freely estimated between adjacent items to allow for order effects among the relationships that participants had listed, but all loadings and all intercepts were invariant. Factor scores were saved from this model for use in our analyses.

Self-construal. Self-construal data from the United Kingdom, Romania, and Thailand were previously analyzed by Owe (2012), but her analysis focused on the development of adequate measures, extending those developed and validated by Vignoles et al. (in press), based on data derived from 55 cultural groups in 33 nations. In the present study, 19 items defining the four most relevant dimensions from Owe's extended scale were included. These were self-direction versus receptiveness to others (sample item: "You prefer to do what you want without letting your family influence you"); self-reliance versus dependence on others (sample item: "You try to avoid being reliant on others"); self-containment versus connection to others (sample item: "If someone in your family is sad, you feel the sadness as if it were your own"); self-interest versus commitment to others (sample item: "You value relations with the people close to you more than your personal achievements"). Each scale contains some items keyed toward one end of the scale and other items keyed toward the opposite end of the scale. Items have 9-point response scales keyed from *not at all* to *exactly*.

Analysis of the 19 self-construal items included a separate method factor modeling acquiescence, which loaded onto every indicator at a fixed value of 1 and was allowed to correlate with the four substantive factors (Welkenhuysen-Gybels et al., 2003). The remaining factors were scaled by fixing one item loading to 1. As sample mean values on the four cultural models of self-scales are to be tested as cross-sample moderators, evidence of scalar invariance is especially desirable for this measure. However, even in single samples, CFAs of commonly used self-construal scales typically show unacceptable model fit: For example, CFAs of the Singelis (1994) scale by Levine et al. (2003) and Hardin (2006) showed values of CFI ranging from .25 to .65 and RMSEA ranging from .076 to .268. The current measure performed considerably better than this. After dropping one item and adding covariances between four pairs of items that had similar wordings, a multi-group CFA supported full metric invariance and partial scalar invariance of the four substantive factors: $\chi^2(1417) = 2,875.461$, $p < .001$, CFI = .900, RMSEA = .062, and SRMR = .074. In this model, all loadings and a majority of intercepts were invariant; however, 26 (of a possible 126) intercepts were freed for specific samples, ensuring that between-culture variance would not be confounded by items with idiosyncratic intercepts in particular cultures. The freed intercepts were approximately evenly distributed between the four scales. Factor scores were saved from this model, and adjusted sample means were computed for our main analyses, controlling for age and gender to measure cultural models of selfhood.

Table 2. Correlations Between All Variables.

Variable	SD	SR	SC	SI	SE	RH	D	LS
SD	—	.24	.66	.38	.07	−.17	.07	−.16
SR	−.23	—	−.10	.17	.30	.03	−.09	.04
SC	.80**	−.38	—	.44	−.08	−.21	.13	−.17
SI	.04	.81**	−.30	—	.09	−.13	.09	−.08
SE	.20	.08	.15	.28	—	.15	−.28	.30
RH	−.69*	.05	−.75*	.07	.22	—	−.22	.25
D	−.30	.46	.11	.23	.20	−.10	—	−.47
LS	.10	−.39	.14	−.31	.65*	.28	.00	—
Individualism	.66*	−.47	.64*	−.09	.12	−.52	−.09	.08

Note. Culture-level correlations below the diagonal, *n* = 10, pan-cultural individual-level correlations above the diagonal, *n* = 2,604-2,686, values > .05 are significant at *p* < .01. SD = self-direction; SR = self-reliance; SC = self-containment; SI = self-interest; SE = self-efficacy; RH = relationship harmony; D = depression; LS = life satisfaction.
*p < .05. ***p* < .01.

Individualism-collectivism. The scores provided by Hofstede (2001) were used. His score for Malaysia was assigned to both Malaysian samples in the present study.

Results

Sample means for all measures are shown in Table 1. Correlations between all measures at the individual and cultural levels are provided in Table 2. Group-mean-centered values were used to compute the individual-level correlations. As the table shows, the predictors are not wholly independent of one another at the cultural level. Among the present samples, cultures characterized by self-direction are also high on self-containment. Cultures characterized by self-reliance are also high on self-interest. Consistent with the results of Vignoles et al. (in press), samples high on Hofstede's (2001) measure of individualism tend to be high on self-direction and self-containment but not on self-reliance or self-interest.

Table 3 shows individual-level correlations within each sample between self-efficacy and relationship harmony as predictors, and depression and life satisfaction as dependent measures. High self-efficacy is significantly associated with low depression in nine of the 10 samples and with high life satisfaction in all 10 samples. High relationship harmony is significantly associated with low depression in nine samples and with high life satisfaction in all 10 samples.

The issue in question is whether measures of the culture of the 10 samples are found to moderate the strength of these effects. The hypotheses were tested using hierarchical linear modeling (HLM version 6, Raudenbush, Bryk, & Congdon, 2007), with individuals (Level 1: *n* = 2,597) clustered within cultures (Level 2: *n* = 10). Currently available simulation studies focused upon sample sizes of 30 and more (e.g., Maas & Hox, 2005) provide no firm basis upon which to judge the magnitude of the limitations due to our relatively small number of Level 2 samples. Nonetheless, given the sampling constraints of cross-cultural research, the results from 10 samples can provide important indications (Nezlek, 2008, 2011) beyond the bicultural contrasts typical of the prior literature. Estimated intra-class correlations indicated that 4.95% of variance in depression and 10.37% of variance in life satisfaction were at the cultural level of analysis. However, note that our main goal was not to predict cultural mean differences but to test for culture-level moderators of the individual-level predictive effects of self-efficacy and relationship harmony on depression and life satisfaction.

Given the small sample size at Level 2, we tested each potential culture-level moderator in a separate model; thus, we tested five models predicting depression scores and five models

Table 3. Individual-Level Partial Correlations Showing Predictors of Depression and Life Satisfaction by Sample.

	Self-efficacy		Relationship harmony	
Group	CES-D	LS	CES-D	LS
British	−.42***	.37***	−.35***	.41***
Chinese	−.26***	.27***	−.30***	.23***
Finns	−.40***	.25**	−.36***	.36***
Hong Kongers	−.22**	.25**	−.20*	.35***
Malay Chinese	−.18	.59***	−.33**	.38***
Malay Malays	−.34***	.28***	−.31***	.37***
Pakistanis	−.18**	.20**	−.12	.18**
Romanians	−.35***	.36***	−.18***	.19***
Thais	−.32***	.35***	−.26***	.24***
Turks	−.15**	.29***	−.23***	.26***

Note. CES-D = Center for Epidemiological Studies–Depression; LS = life satisfaction; covariates = age and gender.
*p < .05. **p < .01. ***p < .001.

Table 4. Culture-Level Moderators of Self-Efficacy and Relationship Harmony as Predictors of Depression and Life Satisfaction.

Culture-level moderator	Dependent measure	Self-efficacy			Relationship harmony		
		H	γ	t	H	γ	t
Individualism	CES-D	1a	−.100	3.84***	2a	−.060	3.17**
	LS	3a	.127	2.02*	4a	.224	4.86***
Self-direction	CES-D	1b	−.233	3.80***	2b	−.087	1.73
	LS	3b	.308	2.07*	4b	.248	2.05*
Self-reliance	CES-D	1c	.096	1.65	2c	.106	2.45*
	LS	3c	−.172	1.22	4c	−.494	4.73***
Self-containment	CES-D	1d	−.096	2.93**	2d	.055	1.98*
	LS	3d	.115	1.45	4d	−.027	0.41
Self-interest	CES-D	1e	−.063	1.15	2e	−.049	1.10
	LS	3e	.117	0.88	4e	−.074	0.68

Note. H = hypothesis number; CES-D = Center for Epidemiological Studies–Depression; LS = life satisfaction; n = 2,598 participants within 10 cultures.
*p < .05. **p < .01. ***p < .001.

predicting life satisfaction scores. In each of these models, we predicted the relevant outcome as a function of individual differences in both self-efficacy and relationship harmony (group-mean centered), and we introduced one of the culture-level variables (grand mean centered) as a main effect and as a moderator of the two within-culture effects. In all 10 models, the main effects of both self-efficacy and relationship harmony were significant (all p < .001), when estimated at the mean level of the relevant culture-level moderator.

Table 4 reports the cross-level interaction effects from the five models predicting depression scores. As shown in the table, H1a, H1b, and H1d are supported but not H1c or H1e. The association of self-efficacy with low depression is significantly stronger in samples characterized by individualism, self-direction, and self-containment but not in samples characterized by self-reliance or self-interest. Figure 1 illustrates the pattern of the significant cross-level interactions, showing the results for H1b.
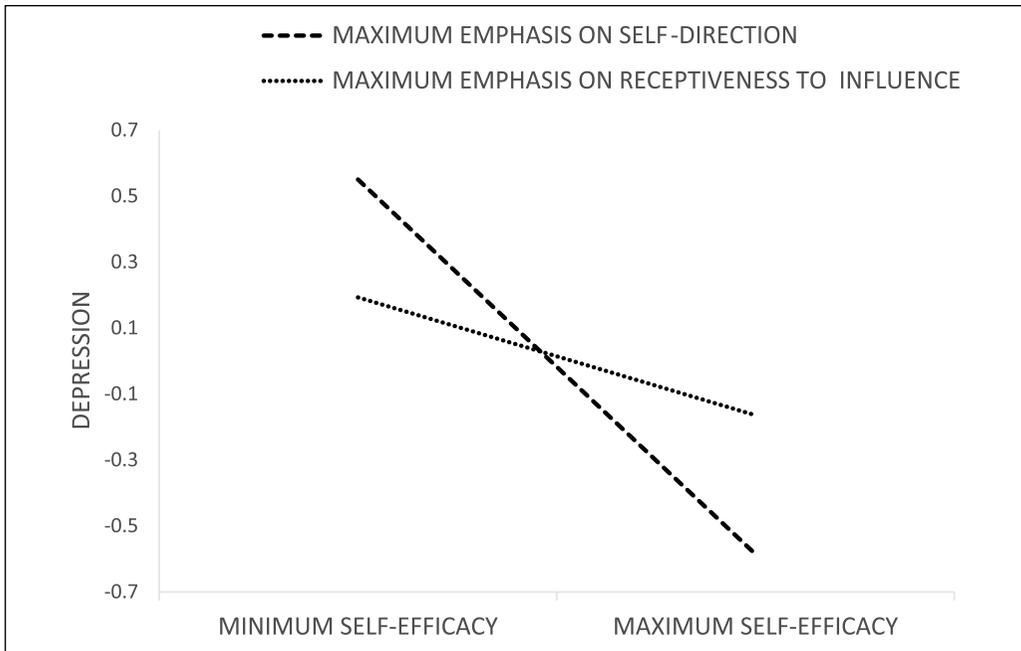
Figure 1. Depression as a function of within-culture variation in self-efficacy, moderated by cultural emphasis on self-direction versus receptiveness to influence (H1b).
Note. Values are estimated at average within-culture values of relationship harmony.

In contrast, there is no evidence for H2a which predicted that the association between low depression and relationship harmony would be stronger in collectivist cultures. Indeed, the effect is significant in the reverse direction. This finding extends the conclusions drawn by Chen et al. (2006), who found no difference between their U.S. and Hong Kong samples in the link between relationship harmony and depression. However, supporting H2c and H2d, the link between low depression and relationship harmony is significantly weaker in samples characterized by high self-reliance and high self-containment. In other words, the negative effect of relationship harmony on depression is stronger in samples scoring toward the other pole of these scales, namely, high dependence on others and high connection with others. Figure 2 shows the results for H2c. H2 is thus supported when tested with the more fine-grained self-construal measures.

Table 4 also reports the cross-level interaction effects from the five models predicting life satisfaction scores. H3a is supported using the individualism score as moderator, and H3b is supported using self-direction as the moderator. As shown in Figure 3, the link between self-efficacy and SWLS is stronger in samples higher on self-direction, whereas none of the other cultural dimensions significantly explained this link. When individualism is used as moderator, H4a is again significantly reversed, as is H4b. The association of relationship harmony with SWLS is stronger in individualist (and self-directed) samples rather than in collectivist samples (and those that are characterized by receptivity to influence). However, support is obtained for H4c. As shown in Figure 4, relationship harmony and SWLS are more strongly associated in samples characterized by high dependence on others.

Our hypotheses focused on the moderating effects of living in cultural contexts with different prevailing models of selfhood, rather than any possible moderating effects of personally endorsing different forms of self-construal. Nonetheless, we conducted additional analyses to test for
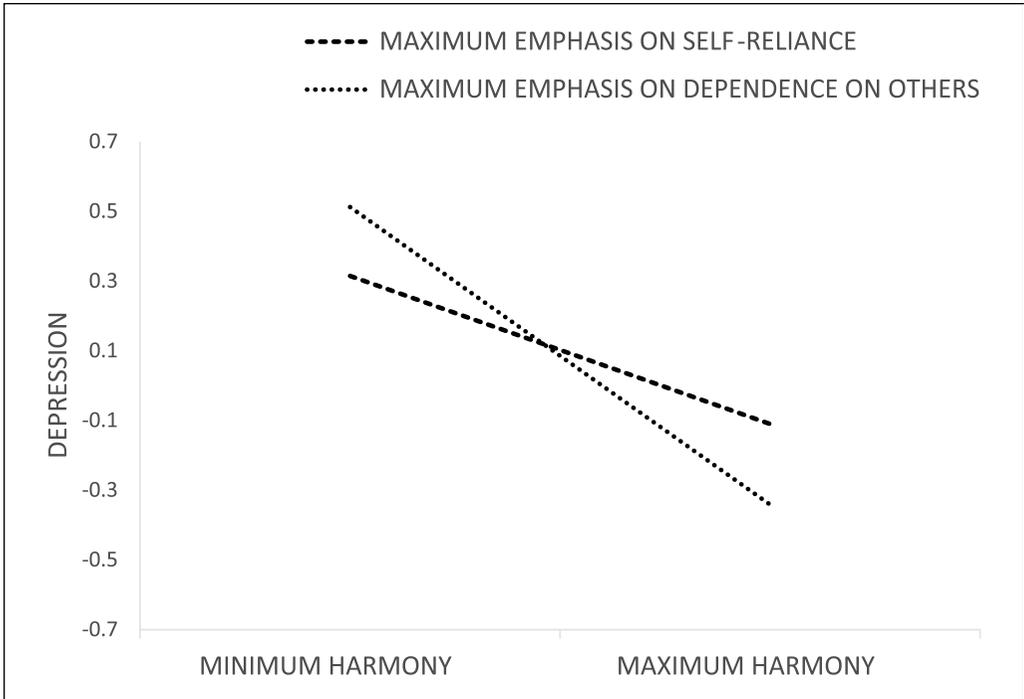
Figure 2. Depression as a function of within-culture variation in relationship harmony, moderated by cultural emphasis on self-reliance versus dependence on others (H2c).
Note. Values are estimated at average within-culture values of self-efficacy.

individual-level moderation effects. For this, we recomputed the series of models reported above, adding individual differences in the relevant self-construal dimensions (grand mean centered) and their interactions with self-efficacy and relationship harmony as Level 1 predictors. If the cross-level interaction effects observed above were driven by individuals' personal self-construals, then we should expect to see a parallel pattern of individual-level interaction effects to the cross-level interactions reported in Table 4, and the cross-level interaction effects should lose significance in these models.

However, just two individual-level interaction effects were significant, and these did not match the cross-level interaction effects reported above. Among individuals high in self-direction, the association of self-efficacy with low depression was significantly weaker ($\gamma = .070$, $t = 2.53$, $p < .05$). Thus, although H1b was supported at the culture level, it is rejected at the individual level. In a similar way, among individuals high in self-reliance, the association of self-efficacy with low depression was significantly weaker ($\gamma = .073$, $t = 3.66$, $p < .001$). Thus, while H1c was unsupported at the culture level, it is significantly reversed at the individual level. Moreover, all significant cross-level interaction effects reported in Table 4 remained significant when controlling for the individual-level interactions, with just one minor exception: The stronger association of relationship harmony with lower depression in samples characterized by connectedness to others was unchanged in magnitude ($\gamma = .055$) but was marginally reduced in statistical significance from $p = .048$ to $p = .066$. In sum, the moderating effects of cultural models of selfhood observed here are truly contextual effects, and they cannot be reduced to effects of individuals' personal self-construals.
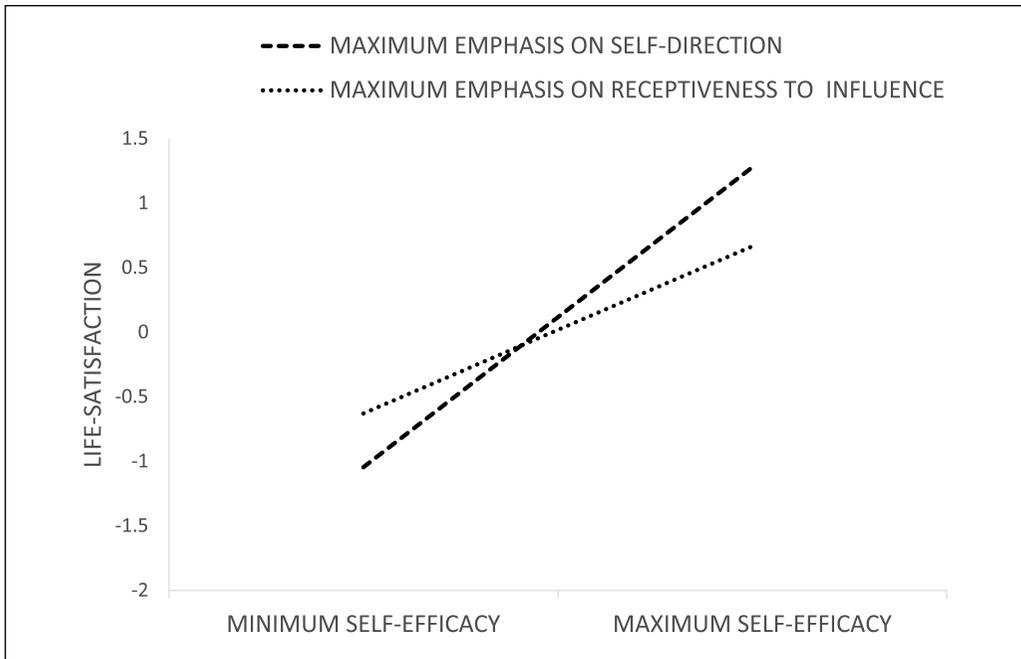
Figure 3. Life satisfaction as a function of within-culture variation in self-efficacy, moderated by cultural emphasis on self-direction versus receptiveness to influence (H3b).
Note. Values are estimated at average within-culture values of relationship harmony.

Discussion

Our results indicate that the previously reported linkages between high self-efficacy and high relationship harmony and low depression are replicable across a broader range of cultures. Similarly, high self-efficacy and high relationship harmony consistently predict high SWLS. These effects are correlational, and it is equally plausible that those who are depressed or dissatisfied will feel less efficacious and less satisfied with their relationships. Indeed, in the part of Chen et al.'s (2006) Hong Kong study that was reported by Stewart et al. (2005), longitudinal data were collected, which showed changes in relations between depression and these two predictors between Time 1 and Time 2 in both directions.

The present findings provide clear support for the value of testing hypotheses across a broader range of cultures. The original hypotheses formulated and tested by Chen et al. (2006) and Stewart et al. (2005) are not supported in broader samples when one uses Hofstede's measure. However, they are supported—in a more nuanced manner—when the more precisely focused cultural models of self-indices are used. Thus, their basic premise of a contrast between individualistic and collectivistic cultures is retained and refined when more specific aspects of the global concept of individualism are identified and itemized. In particular, cultural differences in self-direction (vs. receptiveness to influence) consistently moderated the predictive effects of self-efficacy on both depression and life satisfaction, whereas cultural differences in self-reliance (vs. dependence on others) consistently moderated the corresponding effects of relationship harmony. Cultural differences in self-containment (vs. connection to others) moderated the effects of both predictors on depression but not on life satisfaction; while cultural differences in self-interest (vs. concern for others) showed no significant moderation effects.
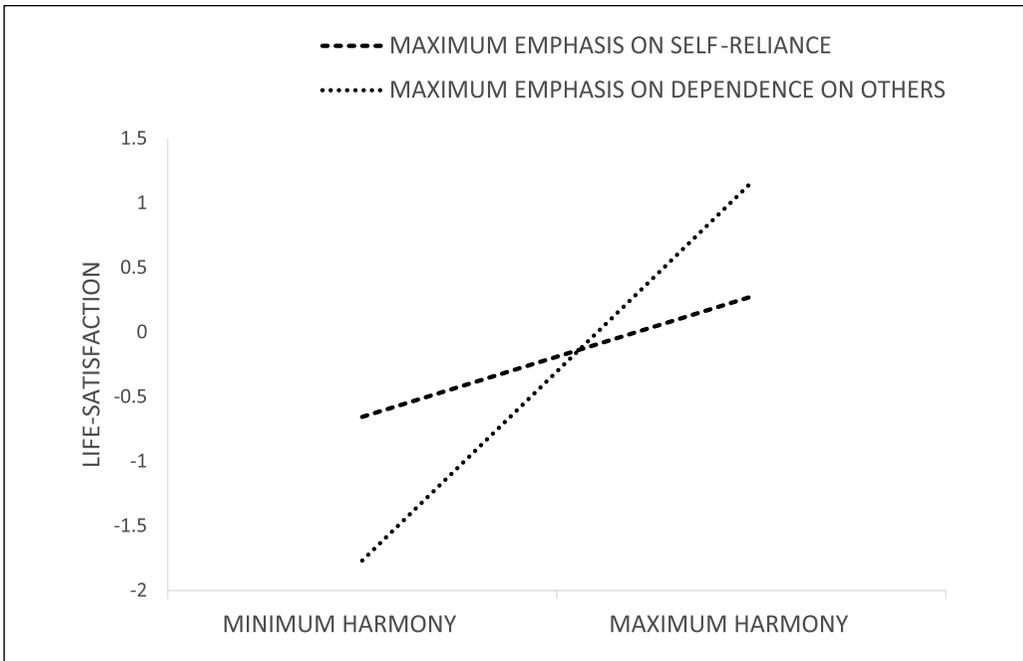
Figure 4. Life satisfaction as a function of within-culture variation in relationship harmony, moderated by cultural emphasis on self-reliance versus dependence on others (H4c).
Note. Values are estimated at average within-culture values of self-efficacy.

The use of self-construal data to characterize cultures is innovative. Indices of self-construal have most frequently been seen as useful in examining individual-level mediations of cultural effects. Their use in this way has rarely proved fruitful (Smith et al., 2013), and this scientific shortcoming may be partly due to the psychometric deficiencies of the measures that have most frequently been used (Levine et al., 2003). However, using the more adequate measures presently employed, we found only two individual-level moderations, compared with 11 culture-level moderations. The two counterintuitive individual-level moderation effects that we did obtain may have been due to suppressor effects. In general, these results emphasize that individuals' outcomes will only become explicable if the sociocultural context within which they operate is also taken into account (Bond, 2013).

The pattern of results differs between the two dependent variables, with stronger effects linking self-efficacy with low depression and stronger results linking relationship harmony with life satisfaction. Four of five hypotheses linking self-efficacy with low depression were supported, and three of five hypotheses linking relationship harmony with life satisfaction were supported. Only four of the remaining 10 hypotheses were supported. Furthermore, the effects obtained were not simply attributable to polar opposites of the same cultural models of self. Cultures characterized by specific models of self have distinctive relevance to each outcome. It seems that personal self-efficacy may be especially protective against depression in contexts where self-direction rather than receptiveness to influence is normative. It seems also that relationship harmony may be especially beneficial for life satisfaction where dependence on others rather than self-reliance is normative.

This pattern of findings helps explain the previous lack of support for Chen and colleagues' prediction that effects of relationship harmony would be stronger in collectivist cultures. Their prediction was not supported in their two-culture comparison of Hong Kong and U.S. participants,

nor in the current study when Hofstede scores were used to define individualism-collectivism. However, the present findings show consistent support for the more precise prediction that relationship harmony would be more beneficial in cultures that emphasize dependence on others than in cultures that emphasize self-reliance. Notably, dependence on others (vs. self-reliance) is often theorized as an important aspect of cultural collectivism (vs. individualism), but it is poorly captured by Hofstede's individualism scores (Table 2; for more extensive evidence, see Vignoles et al., in press). Thus, it is unsurprising that comparisons based on Hofstede scores do not yield the predicted effect.

Our analysis is based on a small and non-representative sample of the world's cultures. In particular, we lacked cultures that score high on self-containment but low on self-direction or vice versa, as well as cultures that score high on self-interest but low on self-reliance or vice versa. This limited our ability to pick apart the roles of these dimensions from each other. The 10 cultural groups that were sampled included only two that would be considered individualistic in terms of Hofstede's (2001) dimension, and the remainder were heavily weighted toward Asian cultures. Still broader sampling is advisable to test the replicability of the moderation effects that were obtained.

The characterization of nations and other large collectivities in terms of scores such as those derived from Hofstede's (2001) project has been rather frequently criticized on the basis that there is considerable variability of values and beliefs within any given nation (Fischer & Schwartz, 2011). It is more likely that culture members' feelings and actions are guided by their perceptions of their more immediate cultural context. It could therefore be the case that the present results were enhanced by the fact that the nation-level predictors were derived from participants' sampled peer group rather than from their nation as a whole.

A final limitation of the present study is that each of the hypotheses included parallel effects of all four cultural models of self dimensions as moderators. Eight of the 16 such predictions were supported, which substantially exceeds chance expectation. The precise pattern of findings observed is interpretable but was not predicted a priori; hence, it requires replication in subsequent research. As the nomological net of these dimensions becomes more fully known, it should become possible to generate and test more precisely formulated predictions.

Declaration of Conflicting Interests

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