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What is This?

Need Satisfaction and Well-Being: Testing Self-Determination Theory in Eight Cultures

A. Timothy Church[1], Marcia S. Katigbak[1], Kenneth D. Locke[2], Hengsheng Zhang[3], Jiliang Shen[3], José de Jesús Vargas-Flores[4], Joselina Ibáñez-Reyes[4], Junko Tanaka-Matsumi[5], Guy J. Curtis[6], Helena F. Cabrera[7], Khairul A. Mastor[8], Juan M. Alvarez[1], Fernando A. Ortiz[9], Jean-Yves R. Simon[10], and Charles M. Ching[1]

Abstract

According to Self-Determination Theory (SDT), satisfaction of needs for autonomy, competence, and relatedness is a universal requirement for psychological well-being. We tested this hypothesis with college students in the United States, Australia, Mexico, Venezuela, the Philippines, Malaysia, China, and Japan. Participants rated the extent to which these needs, plus needs for self-actualization and pleasure-stimulation, were satisfied in various roles and reported their general hedonic (i.e., positive and negative affect) and eudaimonic (e.g., meaning in life, personal growth) well-being. Asian participants averaged lower than non-Asian participants in perceived satisfaction of autonomy, competence, and self-actualization needs and in most aspects of eudaimonic well-being, and these differences were partially accounted for by differences in dialecticism and independent self-construals. Nonetheless, perceived need satisfaction predicted overall well-being to a similar degree in all cultures and in most cultures provided incremental prediction beyond the Big Five traits. Perceived imbalance in the satisfaction of different needs also modestly predicted well-being, particularly negative affect. The study extended support for the universal importance of SDT need satisfaction to several new cultures.

[1]Washington State University, Pullman, WA, USA
[2]University of Idaho, Moscow, ID, USA
[3]Beijing Normal University, Beijing, China
[4]National Autonomous University of Mexico, Iztacala, Mexico City, Mexico
[5]Kwansei Gakuin University, Nishinomiya-City, Hyogoken, Japan
[6]Murdoch University, Perth, Australia
[7]University of Santo Tomas, Manila, Philippines
[8]Universiti Kebangsaan Malaysia, Bangi, Malaysia
[9]Gonzaga University, Spokane, WA, USA
[10]Universidad Central de Venezuela, Caracas, Venezuela

Corresponding Author:
A. Timothy Church, Department of Educational Leadership and Counseling Psychology, Cleveland Hall, Washington State University, Pullman, WA 99164-2136, USA.
Email: church@mail.wsu.edu

Keywords

self-determination theory, well-being, culture, dialecticism, self-construal

Self-Determination Theory (SDT) proposes that certain evolved psychological needs must be satisfied if individuals are to develop to their fullest potential, in the same way that plants require key nutrients to thrive (Deci & Ryan, 1985, 2000; Ryan, 1995; Ryan & Deci, 2008). SDT posits three universal needs: autonomy, competence, and relatedness. Autonomy involves the need to experience one's behavior as freely chosen and volitional, rather than imposed by external forces. Competence involves the need to feel capable and effective in one's actions. Relatedness involves the need for belonging, intimacy, and connectedness to others. SDT theorists view these needs as broad motivational tendencies that operate across life domains and contend that satisfaction of all three needs, not just one or two, is essential for well-being. Although the expression or means of satisfying these needs may vary across cultures, their satisfaction is viewed as essential for well-being in all cultures.

In contrast, some critics of SDT have questioned whether these needs are cultural universals. In particular, several scholars have argued that autonomy is more valued or normative in individualistic or Western cultures (Cross & Markus, 1999; Iyengar & Lepper, 1999; Miller, 1997). However, as noted by Chirkov and Ryan (2001), the existence of cultural differences in the strength of autonomy values does not preclude similarities in the functional impact of autonomy-supportive versus controlling environments. Furthermore, SDT theorists counter that critics tend to confuse autonomy as defined by SDT with independence or individualism (Chirkov, Ryan, Kim, & Kaplan, 2003). For example, behaving in accordance with group norms might be internalized and viewed as autonomous (i.e., freely chosen or volitional) by members of collectivistic cultures (Chirkov, Ryan, & Willness, 2005; Deci & Ryan, 2000).

Given the proposed universality of SDT needs, Deci and Ryan (2000) noted the importance of demonstrating their impact on well-being in all cultures. Accordingly, in the present study, we test the central SDT hypothesis that satisfaction of SDT needs is a universal requirement for well-being by testing this hypothesis in eight diverse cultures. We also examine cultural differences in perceived need satisfaction and well-being and test whether these differences can be accounted for by selected cultural dimensions.

Cross-Cultural Tests of SDT

Although research on SDT is extensive (Ryan & Deci, 2000), cross-cultural tests of the theory are fairly recent and a number of questions remain. We note several observations regarding the cross-cultural findings.

First, researchers typically report some cultural differences in the perceived satisfaction or importance of SDT needs (Chirkov & Ryan, 2001; Chirkov et al., 2005; Levesque, Zuehlke, Stanek, & Ryan, 2004; Sheldon, Elliot, Kim, & Kasser, 2001; Sheldon et al., 2004). For example, Sheldon et al. (2001) found that SDT needs and self-esteem were among the most important needs experienced during satisfying events in both American and South Korean samples. However, relatedness needs were more important and self-esteem needs less important for Koreans, as compared to Americans. More crucial for SDT theory, however, is whether satisfaction of SDT needs is associated with greater well-being in all cultures.

Our second observation is that cross-cultural studies, although few in number, have generally supported the central hypothesis relating SDT need satisfaction to well-being. In some studies, however, the strength of this relationship has varied across cultures. On the one hand, minimal or no differences were found in Levesque et al.'s (2004) comparison of Germans and Americans,

Chirkov and Ryan's (2001) comparison of Russians and Americans, and Chirkov et al.'s (2003) comparison of Americans, Turks, Russians, and South Koreans. Similarly, in a study of 123 countries, Tay and Diener (2011) found that social, respect, mastery, and autonomy needs—which overlap with SDT needs— predicted well-being to a uniform degree across eight world regions. On the other hand, several studies have found cultural differences in the strength of the relationship between SDT need satisfaction and well-being (Chirkov et al., 2005; Deci et al., 2001; Sheldon, Cheng, & Hilpert, 2011; Sheldon et al., 2001). For example, Sheldon et al. (2001) found that SDT needs were more highly correlated with positive affect and affect balance in Korea than in the United States. In a 21-country study, Sheldon et al. (2011) found that well-being was better predicted by competence satisfaction and less well predicted by autonomy satisfaction in individualistic cultures, while the impact of relationship satisfaction on well-being was not affected by the individualism of the cultures. Thus far, however, no consistent pattern of cultural differences has emerged regarding the strength of the relationship between SDT need satisfaction and well-being.

A third observation is that researchers have generally related SDT needs to only hedonic well-being (i.e., positive and negative affect, life satisfaction) or to composites of hedonic and eudaimonic well-being (e.g., personal growth, meaning in life) (Chirkov & Ryan, 2001; Chirkov et al., 2003, 2005; Levesque et al., 2004; Oishi, Diener, Lucas, & Suh, 1999; Sheldon et al., 2001, 2004; Tay & Diener, 2011). They have not reported whether need satisfaction is differentially related to hedonic versus eudaimonic well-being. This is somewhat surprising because SDT theorists have emphasized the distinction between these two types of well-being (Deci & Ryan, 2008; Ryan & Deci, 2001). Ryff et al. have made a similar distinction between subjective well-being and psychological well-being (PWB) and posited six dimensions of PWB: autonomy, environmental mastery, personal growth, purpose in life, positive relations with others, and self-acceptance (Keyes, Shmotkin, & Ryff, 2002; Ryff & Singer, 2006). Given the nature of SDT needs, we anticipated that satisfaction of SDT needs might be more strongly related to aspects of psychological or eudaimonic well-being than to hedonic well-being.

Beyond SDT needs, many other psychological needs have been proposed in the literature (Maslow, 1954; McClelland, 1985; Murray, 1938; Sheldon et al., 2001). In the present study, we assessed two additional needs: self-actualization and pleasure-stimulation. The need to self-actualize or realize one's inherent potential was featured prominently in Maslow's (1954) theory and was also addressed by Rogers (1963) and Allport (1955). Although satisfaction of self-actualization needs may be facilitated by fulfillment of SDT needs (Ryan, 1995), Sheldon et al. (2001) treated self-actualization needs as distinct from SDT needs. We included self-actualization needs in this study because their satisfaction in various social roles seems particularly relevant to general eudaimonic well-being. In addition, just as satisfaction of SDT and self-actualization needs may be particularly relevant for eudaimonic well-being, satisfaction of needs for pleasure-stimulation may be important in predicting general hedonic well-being. Epstein's (1990) cognitive-experiential self-theory as well as psychoanalytic perspectives emphasize the motive to seek pleasure as a basic function of human behavior. Although our main focus in this study was on testing SDT, inclusion of these additional needs enabled us to examine whether SDT needs are unique in predicting hedonic and eudaimonic well-being in a range of cultures.

Finally, SDT researchers sometimes incorporate personality traits in their studies, for example, to demonstrate that SDT constructs are distinct from the Big Five traits (Olesen, 2011) or to show that perceived autonomy can account for within-individual variability in these traits (Lynch, La Guardia, & Ryan, 2009). However, cross-cultural studies have rarely related satisfaction of SDT needs to well-being while controlling for personality traits. Big Five traits such as extraversion and neuroticism are strong predictors of well-being (Lucas & Diener, 2008). Thus, an important question is whether SDT needs provide incremental prediction of hedonic or

eudaimonic well-being beyond the Big Five traits (Sheldon et al., 2011). Although the SDT needs are important theoretical constructs, their applied significance will depend on whether they can contribute unique prediction beyond personality traits.

Need Balance

In addition to the level of one's need satisfaction, the balance of one's need satisfaction across SDT needs might also predict well-being. Sheldon and Niemiec (2006) proposed that an imbalance in the satisfaction of autonomy, competence, and relatedness needs could reflect inappropriate allocation of resources across work, interpersonal, or other life domains. The resulting conflicts might lead to lower hedonic well-being. In addition, eudaimonic philosophies highlight the importance of balance in one's life, so more balanced need satisfaction might also lead to greater eudaimonic well-being. Sheldon and Niemiec found that need balance contributed modest incremental prediction of hedonic well-being beyond the level of need satisfaction and Big Five Neuroticism. However, the researchers did not test the need balance hypothesis across cultures, so the present study was apparently the first to do so.

Cultural Dimensions, SDT Needs, and Well-Being

As noted previously, a few studies have reported cultural differences in the perceived satisfaction or importance of SDT needs. However, researchers have rarely measured the cultural dimensions that might account for these differences. In the present study, we examined the ability of three cultural dimensions—dialecticism, individualism-collectivism, and cultural tightness-looseness—to account for cultural differences in need satisfaction and well-being. Dialecticism has been defined as a system of thought rooted in Eastern philosophical traditions and characterized by acceptance of contradiction, expectations of complexity and change, and holistic thinking (Peng & Nisbett, 1999; Spencer-Rodgers, Williams, & Peng, 2010). Spencer-Rodgers et al. suggested that greater dialecticism could lead to lower well-being because it causes individuals to attend to both the negative and positive aspects of experiences. Similarly, Spencer-Rodgers, Peng, Wang, and Hou (2004) argued that East Asians, more than individuals in Western cultures, acknowledge psychological contradictions, leading to greater evaluative ambivalence in their self-appraisals and judgments of happiness. Indeed, cross-cultural studies suggest that East Asians report lower self-esteem and hedonic well-being than European Americans (Boucher, Peng, Shi, & Wang, 2009; Diener & Diener, 1995; Hamamura, Heine, & Paulhus, 2008; Heine & Lehman, 1997; Lee & Seligman, 1997; Spencer-Rodgers et al., 2004; Steger, Kawabata, Shimai, & Otake, 2008). Given the expected relationship between SDT need satisfaction and well-being, we anticipated that perceived satisfaction of SDT needs would also be lower in dialectical cultures.

Cultural differences in need satisfaction and well-being might also be accounted for by the individualism-collectivism distinction (Diener, Diener, & Diener, 1995; Triandis, 1995). In a study of 55 countries, Diener et al. (1995) found that culture-level measures of individualism correlated highly with hedonic well-being (i.e., happiness and life satisfaction). The researchers suggested that individualistic societies allow individuals more freedom to pursue personal goals and choose their own life course, leading to greater well-being. In a 21-country study, Sheldon et al. (2011) also found higher hedonic well-being (i.e., a composite of positive affect, negative affect, and life satisfaction) in more individualistic cultures. Heine, Lehman, Markus, and Kitayama (1999) attributed the higher levels of self-esteem in North American cultures, compared to East Asian cultures, to North American values that emphasize individualism. Finally, Steger et al. (2008) found that Americans, compared to Japanese, averaged higher in the presence

of meaning in their lives but lower in the search for meaning. They attributed the differences to the emphasis on outcomes (i.e., the presence of meaning) versus process (i.e., the search for meaning) in individualistic (independent) versus collectivistic (interdependent) cultures, respectively.

The final cultural dimension assessed in this study was tightness-looseness (Gelfand, Nishii, & Raver, 2006; Gelfand et al., 2011). As defined by Gelfand et al. (2006), cultural tightness refers to "the strength of social norms and the degree of sanctioning within societies" (p. 1226). This dimension has not yet been directly related to need satisfaction or well-being. However, given the correlates of tightness at the cultural level (e.g., more autocratic rule and fewer civil liberties) and at the individual level (e.g., higher impulse control)—plus the greater situational constraints on behavior in tight cultures—we expected that need satisfaction and well-being would be lower in tight cultures than in loose cultures (Gelfand et al., 2011). This might be especially the case for needs and aspects of well-being related to autonomy.

Overview of the Present Study

The data analyzed here were collected as part of a larger study on self-concept consistency and stability that involved different theoretical frameworks, hypotheses, and analyses (Church et al., 2012). For the present study, we tested hypotheses that integrate aspects of SDT and cultural psychology theory. Cultural psychologists emphasize the "mutually constitutive" and deeply intertwined nature of culture and personality and tend to adopt a relativistic perspective on psychological phenomena across cultures (Markus & Kitayama, 1991, 1998; Miller, 1997).

Participants in eight cultures rated the extent to which their needs were satisfied in various roles (i.e., with close friends, parents, professors, younger siblings or relatives, and strangers) and completed measures of hedonic and eudaimonic well-being, the Big Five traits, and the three cultural dimensions. Consistent with cultural psychology theory, we expected to find cultural mean differences in need satisfaction and well-being and that these differences would be accounted for to some extent by the three cultural dimensions. In more specific predictions, we anticipated that satisfaction of relatedness needs, and aspects of well-being related to positive relations with others, might be higher in collectivistic cultures than in individualistic cultures and that satisfaction of autonomy needs, and aspects of well-being related to autonomy, might be lower in tight cultures than in loose cultures.

Our most important hypothesis was that satisfaction of SDT needs would predict both hedonic and eudaimonic well-being in all cultures, both before and after controlling for the Big Five traits. Consistent with SDT theory, we also hypothesized that each of the SDT needs would provide unique prediction, indicating that all three needs are independently necessary for well-being (Deci & Ryan, 2000; Sheldon et al., 2011). We examined whether satisfaction of hedonic needs (i.e., pleasure-stimulation) and eudaimonic (e.g., SDT) needs are differentially related to hedonic and eudaimonic well-being. Finally, extending the work of Sheldon and Niemiec (2006) to cultures outside the United States, we hypothesized that need balance would provide modest incremental prediction of well-being beyond that provided by overall need satisfaction and the Big Five traits.

The eight cultures in the study were sampled to vary in dialecticism, individualism-collectivism, and tightness-looseness. Church et al. (in press) reported the cultural differences on these dimensions. Consistent with expectations, the four Asian cultures (i.e., the Philippines, Malaysia, China, and Japan) all averaged higher in dialecticism than the four non-Asian cultures (i.e., the United States, Australia, Mexico, and Venezuela). Within the Asian cultures, the Filipinos and Malaysians averaged lower in dialecticism than the Chinese and Japanese. The four Asian cultures also averaged higher than the four non-Asian cultures in cultural tightness, although not all

differences were statistically significant. Within the Asian cultures, only the Filipinos described their culture as less tight than did the Japanese. Venezuelans, more than any of the other cultural groups, perceived their culture to be relatively loose.

Based on their scores for independent and collective self-construals, the American and Australian samples can be viewed as relatively individualistic and the Filipino, Malaysian, and Chinese samples as collectivistic (Church et al., 2012). The Mexican and Venezuelan samples averaged higher than the Americans and Australians in independent self-construals, which is inconsistent with the traditional view of Mexico and Venezuela as collectivistic, but consistent with previous findings in Mexican samples (Church et al., 2003, 2006; Morling & Lamoreaux, 2008; Schwartz, 2002). Also consistent with other studies, the Japanese averaged low on *both* independent and interdependent self-construals (Kim et al., 1996; Kobayashi, Kerbo, & Sharp, 2010). Finally, there were few and only modest cultural differences in relational self-construals.

In summary, the results for the dialecticism and tightness measures largely conformed to expectations for these cultures, while some of the self-construal results departed from the traditional view of these cultures, but replicated previous results. The status of the eight cultures on these cultural dimensions provided a basis for interpreting the cultural differences in need satisfaction and well-being identified in the present study.

Method

Sample

United States. The U.S. sample included 153 college students (58 men, 95 women), representing all year levels and a variety of major fields of study, from the University of Idaho. Mean age was 19.95 years (SD = 2.91). Ethnic backgrounds were as follows: White/Caucasian (n = 131), Latino (n = 6), Asian (n = 3), African American (n = 2), Native American (n = 1), Native Hawaiian (n = 1), multiracial (n = 4), and other or not reporting (n = 5).[1]

Australia. The Australian sample included 122 college students (20 men, 102 women), representing all year levels, from Murdoch University in Perth. Mean age was 26.09 (SD = 9.41). Most students (92.6%) were majoring in social sciences. Participants reported the following ethnic backgrounds: Anglo-Celtic or European (n = 92), Asian (n = 8), multiracial (n = 6), African (n = 5), Middle Eastern (n = 1), and other or not reporting (n = 10).

Mexico. The Mexican sample included 158 Mexican college students (74 men, 84 women), representing all year levels, from the National Autonomous University of Mexico at Iztacala. Mean age was 20.03 years (SD = 2.46). Students were majoring primarily in social sciences (81.0%). Participants reported the following ethnic backgrounds: Mestizo (n = 145), Central American (n = 6), Spanish (n = 2), South American (n = 2), and not reporting (n = 3). Mestizos, who share Spanish and indigenous Indian ethnicity, are the majority ethnic group in Mexico.

Venezuela. The Venezuelan sample included 102 college students (45 men, 53 women, 4 not reporting), representing all year levels and a variety of majors, from the Central University of Venezuela in Caracas (n = 57), the University Institute of Management Technology in Los Teques (n = 24), and the National University of Experimental Polytechnics of the Armed Forces in Los Teques (n = 21). Mean age was 24.34 (SD = 6.41). Self-reported ethnicities were as follows: Criole (n = 72), European (n = 18), Indigenous (n = 1), African (n = 1), and other or not reporting (n = 10).

Philippines. The Philippine sample included 167 college students (76 men, 91 women), representing all year levels, from the University of Santo Tomas in Manila. Mean age was 18.15 (SD = 1.37). Most students were majoring in business/economics (97.6%). Self-reported ethnic backgrounds were Filipino (n = 136), multiracial (n = 2), and not reporting (n = 29).

Malaysia. The Malaysian sample included 268 college students (107 men, 159 women, 2 not reporting), representing all year levels and a variety of majors, from the National University of Malaysia (Universiti Kebangsaan Malaysia) in Bangi. Mean age was 20.31 years (SD = 1.61). Ethnic backgrounds were as follows: Malay (n = 131), Chinese (n = 123), Indian (n = 6), Eurasian (n = 1), Sino-Kadazan (n = 1), multiracial (n = 2), and 4 other or not reporting.

China. The Chinese sample included 223 college students (107 men, 116 women), representing all year levels and a variety of majors, from Beijing Normal University (n = 98), Beihang University (n = 48), and Tsinghua University (n = 28), all in Beijing, and Henan University (n = 49) in Kaifeng. Mean age was 21.06 years (SD = 1.15). Most participants reported their ethnicity as Han Chinese (n = 207); other ethnic groups represented by 1 to 4 participants include Mongol, Hui, Tujia, Zhuang, Manchu, Yi, and other or not reporting.

Japan. The Japanese sample included 191 college students (111 men, 80 women), representing all year levels, from Kwansei Gakuin University in Nishinomiya. Mean age was 20.32 (SD = 1.34). Most students were majoring in psychology or other social science fields (63.9%) or business/economics (21.5%). Because of the anticipated ethnic homogeneity of the sample, we did not ask about ethnicity but did verify that none were international students.

Instruments

Translation. All instruments were translated from English into Spanish, Filipino (Tagalog), Malaysian, Chinese, and Japanese using the back-translation method.[2] Minor modifications to the translations were made based on the back-translation process. The cross-cultural measurement equivalence of the instruments is addressed in a later section.

Need Satisfaction. This instrument measured the extent to which each of five needs, including the three needs from SDT, were satisfied in each of five social roles: with close friends, parents, professors, younger siblings or relatives, and strangers. Participants rated how much each need was satisfied in each role using a 5-point scale (1 = *the need is not at all satisfied* to 5 = *the need is completely satisfied*). Definitions of the needs, which were adapted from Sheldon et al. (2001), were as follows: *Autonomy*: Feeling like you are the cause of your own actions (rather than feeling that external forces or pressures are the cause of your actions); *Competence*: Feeling that you are very capable and effective in your actions; *Relatedness-Belongingness*: Feeling that you have regular intimate contact with people who care about you; *Self-actualization-Meaning*: Feeling that you are developing your best potentials and making life meaningful; and *Pleasure-Stimulation*: Feeling that you get plenty of enjoyment and pleasure. To obtain more general and reliable measures, we computed a composite score for each need by averaging the ratings for each need across the five roles. Most of the α reliabilities, which are shown in Table 1, were acceptable for short (five-item) scales. Because some values were marginal, we used both MANOVA and mean and covariance structures (MACS) analyses to compare means across cultures. MACS analyses correct for unreliability of measurement.

Measure of Hedonic Well-being

Positive and Negative Affect Schedule—Expanded Form (PANAS-X; Watson & Clark, 1994). We selected 20 items from this measure, including items from the Negative Affect, Positive Affect, Joviality, and Sadness scales. Participants rated each item on a 5-point scale (1 = *very slightly or not at all* to 5 = *extremely*) to indicate how they generally or usually feel. In each culture, principal-axis factor analyses yielded clear two-factor solutions defined by the positive and negative emotion items, respectively. Therefore, we computed two scores by averaging all positive emotion terms (hereafter referred to as Positive Affect, or PA) and all negative emotion terms (Negative Affect, or NA). Across the eight countries, α reliabilities ranged from .77 to .88 for Positive Affect and from .80 to .88 for Negative Affect (see Table 1).

Table 1. Internal Consistency Reliability Estimates

Scale	Number of items	U.S.	Australia	Mexico	Venezuela	Philippines	Malaysia	China	Japan
Need Satisfaction									
Autonomy	5	.55	.56	.70	.78	.42	.39	.45	.62
Competence	5	.61	.65	.78	.79	.50	.55	.57	.73
Relatedness	5	.58	.66	.68	.75	.56	.61	.67	.60
Self-Actualization	5	.63	.65	.76	.76	.58	.57	.63	.75
Pleasure-Stimulation	5	.46	.56	.73	.75	.58	.58	.66	.70
Positive and Negative Affect Schedule									
Positive Affect	10	.81	.84	.81	.83	.81	.88	.81	.77
Negative Affect	10	.83	.88	.83	.80	.81	.86	.84	.84
Meaning in Life									
Presence	5	.89	.91	.83	.83	.77	.85	.87	.89
Search	5	.91	.90	.88	.87	.80	.80	.84	.92
Psychological Well-Being									
Autonomy	8	.75	.83	.78	.63	.62	.64	.74	.79
Environmental Mastery	6	.71	.81	.64	.56	.38	.62	.66	.62
Personal Growth	7	.78	.79	.70	.64	.77	.73	.54	.72
Purpose in Life	6	.79	.82	.82	.82	.65	.75	.76	.81
Positive Relations With Others	6	.82	.84	.69	.72	.78	.71	.77	.85
Self-Acceptance	6	.85	.88	.79	.64	.65	.61	.77	.78
Well-Being Component	62	.94	.96	.94	.91	.91	.93	.93	.94
Self-Construal Scale									
Relational	11	.84	.82	.72	.76	.74	.73	.73	.80
Independent	14	.68	.76	.70	.55	.80	.69	.64	.74
Collective	13	.79	.75	.77	.81	.80	.69	.79	.73
Dialectical Self Scale	20	.77	.80	.75	.70	.59	.72	.78	.73
Cultural Tightness	14	.82	.80	.76	.70	.66	.61	.55	.81
Big Five									
Extraversion	6	.83	.80	.63	.74	.78	.73	.79	.87
Agreeableness	6	.59	.54	.66	.76	.62	.70	.66	.58
Conscientiousness	6	.62	.71	.55	.62	.76	.73	.69	.60
Emotional Stability	6	.76	.75	.59	.69	.69	.55	.64	.62
Openness to Experience	6	.72	.72	.63	.69	.55	.62	.66	.58

Measures of Eudaimonic Well-Being

Meaning in Life Questionnaire (MLQ; Steger, Frazier, Oishi, & Kaler, 2006). This 10-item scale is comprised of two subscales. The five-item Presence subscale (MLQ-Presence) measures the extent to which one has a sense of meaning in one's life. The five-item Search subscale (MLQ-Search) measures the extent to which one is searching for meaning in one's life. Ratings are made on a 7-point scale that ranges from 1 = *absolutely untrue* to 7 = *absolutely true*. Across the eight countries, α reliabilities ranged from .77 to .91 for the Presence subscale and from .80 to .92 for the Search subscale (see Table 1).

Scales of PWB (Ryff, 1989). We administered a 39-item version of Ryff's (1989) measure that has shown acceptable factorial validity and internal consistency reliability in Dutch, Spanish,

and Columbian samples (Van Dierendonck, 2005; Van Dierendonck, Díaz, Rodríguez-Carvajal, Blanco, & Moreno-Jiménez, 2008). The instrument contains six to eight items for each of the following scales: Autonomy, Environmental Mastery, Personal Growth, Purpose in Life, Positive Relations With Others, and Self-Acceptance. Participants indicated their level of agreement with each item using a 6-point scale that ranged from 1 = *strongly disagree* to 6 = *strongly agree*. Most of the α reliabilities, which are shown in Table 1, were acceptable, but a few values were low. Therefore, we used both MANOVA and MACS analyses to compare the means across cultures.

Well-being component score. In each culture, a principal-components analysis of the well-being measures revealed a dominant first component (eigenvalues from 4.1 to 5.3, as compared to .91 to 1.06 for the second component). The MLQ-Search scale was excluded from this analysis because it measures the search for, rather than presence of, meaning in life. The regression-method factor score for the first component was used as a general index of well-being, incorporating both hedonic and eudaimonic aspects. As seen in Table 1, α reliabilities ranged from .91 to .96 across cultures.

Measures of Cultural Dimensions

Self-construal scales. To assess self-construals, a central aspect of individualism-collectivism, we administered 14 items from Singelis's (1994) Independent Self-Construal scale, the 11 items from Cross, Bacon, and Morris's (2000) Relational Self-Construal Scale, 10 collective items from Kashima and Hardie's (2000) Relational, Individual, and Collective Self-Aspects Scale, and 3 items from Yamaguchi's (1994) Collectivism scale. The 13 collectivism items were scored as a single scale. A sample independent self-construal item is "I enjoy being unique and different from others in many respects." A sample relational self-construal item is "My close relationships are an important reflection of who I am." A sample collective self-construal item is "I think it is most important in life to work for causes to improve the well-being of my group." Participants indicated their level of agreement using a 6-point scale that ranged from 1 = *strongly disagree* to 6 = *strongly agree*. Alpha reliabilities ranged from .55 to .80 for the Independent scale, .72 to .84 for the Relational scale, and .69 to .81 for the Collective scale (see Table 1).

Dialectical Self Scale (DSS; Spencer-Rodgers, Srivastava et al.,2010). We administered 20 items from the DSS (Spencer-Rodgers, Srivastava et al., 2010), which included 14 items from the Abbreviated DSS scale, plus 6 additional items from the original 32-item measure. Items assess acceptance of contradiction and perceptions of one's own cognitive and behavioral change. Sample dialecticism items are "I am constantly changing and am different from one time to the next," and "my world is full of contradictions that cannot be resolved." Participants rated their level of agreement on a 7-point scale that ranged from 1 = *strongly disagree* to 7 = *strongly agree*. Internal consistency reliability was good except in the Philippine sample (see Table 1).

Cultural Tightness-Looseness Scale. Gelfand et al. (2011) constructed a six-item measure to assess participants' perceptions of the strength of social norms and the degree of sanctioning of behavior within their country. We added nine new items to improve reliability and the balance of positive- and reverse-keyed items.[3] A sample item is "In this country, there are very clear expectations for how people should act in most situations." Participants rated their level of agreement on a 6-point scale that ranged from 1 = *strongly disagree* to 6 = *strongly agree*. Most reliability estimates were good, but they were marginal in the Malaysian and Chinese samples (see Table 1).

Big Five Measure. Each of the Big Five dimensions was measured by six trait adjectives (Goldberg, 1992; Saucier, 1994), including some reverse-keyed (r) traits, as follows: for Extraversion, talkative, extraverted, energetic, cheerful, shy(r), and quiet(r); for Agreeableness, sympathetic, kind, helpful, respectful, selfish(r), and boastful(r); for Conscientiousness, organized,

disciplined, industrious, careless(r), wasteful(r), and lazy(r); for Emotional Stability, relaxed, calm, moody(r), jealous(r), nervous(r), and irritable(r); and for Openness to Experience, creative, imaginative, intelligent, artistic, open-minded, and shallow(r). Using a 5-point scale (1 = *not at all descriptive of me* to 5 = *extremely descriptive of me*), participants rated their traits in general. Most of the α reliability estimates were acceptable for short scales (see Table 1).

Cross-Cultural Measurement Equivalence

We conducted MACS analyses to test the metric (factor loading) and scalar (intercept) equivalence of the instruments across cultures. For most instruments, the latent constructs (e.g., the Big Five traits) were each measured by three item parcels (Kishton & Widaman, 1994). For the MLQ, the Presence and Search constructs were measured by the five items from the relevant subscales. For the Need Satisfaction instrument, each latent need-satisfaction construct (autonomy, competence, etc.) was measured by the satisfaction ratings for the five specific roles. For each instrument, model fit with all factor loadings constrained to be equal across cultures ranged from acceptable to very good (CFI range = .85 to .99; RMSEA range = .02 to .04). Thus, metric equivalence across cultures was acceptable.

Metric (loading) equivalence is sufficient for comparisons of correlational relationships across cultures, whereas scalar (intercept) equivalence is preferred when scale means will be compared (Church, 2010; Steenkamp & Baumgartner, 1998). A demonstration of scalar equivalence was most important for the need satisfaction and well-being measures. For most of the need-satisfaction constructs, it was necessary to freely estimate (rather than constrain to equality) one of three intercepts across all cultures and in some cases an additional intercept in a particular culture (usually Malaysia). After doing so, the CFI indices ranged from .81 to .90, and the RMSEA indices ranged from .03 to .04. For the well-being measures, we freely estimated two of six intercepts for the PANAS-X measure, 5 of 10 intercepts for the MLQ, and 5 of 18 intercepts for the PWB measure. After doing so, model fit was good (CFI range = .91 to .95; RMSEA range = .03 to .04). Because only partial scalar equivalence was demonstrated, some caution is warranted in interpreting the cultural mean differences in need satisfaction and well-being.

Procedure

All participants filled out the Big Five and Need Satisfaction measures first. Approximately half the participants then filled out the remaining instruments in the following order, which alternated between well-being and cultural measures: PWB, cultural tightness, PANAS-X, the self-construal scales, MLQ, and the dialecticism measure. The other half of the participants completed these instruments in reverse order. In the United States, Australia, and Venezuela, research participants were recruited in classes or research participant pools and completed the questionnaires outside class. In Mexico, the Philippines, Malaysia, China, and Japan, the questionnaires were filled out by volunteers during regular classes.

Results

Cultural Differences in Need Satisfaction and Well-Being

Need satisfaction. We expected to find cultural differences in need satisfaction and well-being, and that these differences would be accounted for to some extent by the cultural dimensions included in the study. To compare need satisfaction across cultures, we conducted a MANOVA with culture and gender as independent variables and the five need composite scores (autonomy,

Table 2. Cultural Differences in Need Satisfaction Across Roles

Need Satisfaction Composite	U.S.	Australia	Mexico	Venezuela	Philippines	Malaysia	China	Japan	η_p^2
Autonomy									
M	3.65 b,c	3.54 b	3.86 c,d	3.91 d	3.20 a	3.07 a	3.47 b	3.09 a	.19
SD	.62	.62	.70	.81	.60	.54	.53	.70	
Competence									
M	3.86 c,d	3.68 c	3.97 d	4.10 d	3.30 b	3.30 b	3.68 c	2.94 a	.23
SD	.55	.62	.70	.78	.60	.60	.56	.70	
Relatedness									
M	3.39 b,c	3.01 a	3.57 c	3.63 c	3.54 c	3.53 c	3.18 a,b	3.17 a,b	.08
SD	.58	.69	.67	.84	.60	.58	.62	.64	
Self-actualization									
M	3.61 c,d	3.28 b	3.77 d,e	4.00 e	3.53 b,c,d	3.46 b,c	3.27 b	2.96 a	.14
SD	.64	.71	.74	.77	.63	.59	.66	.79	
Pleasure-Stimulation									
M	3.45 b,c	3.11 a	3.59 c	3.70 c	3.54 b,c	3.49 b,c	3.33 a,b	3.15 a	.06
SD	.54	.62	.74	.76	.61	.59	.62	.74	

Note: Means that share the same subscript were not significantly different in follow-up Tukey tests. η_p^2 = effect size (partial eta^2) in follow-up ANOVAs.

competence, relatedness, self-actualization, and pleasure-stimulation) as dependent variables. Given the large size of our combined-culture sample, we set $\alpha = .01$. In addition to the MANOVA, we examined the latent mean differences estimated by the MACS analyses that were used to test for scalar equivalence. Because the results of the MANOVA and MACS analyses were very similar, we report only the MANOVA results, which are expressed in terms of more interpretable raw score means. The MACS analyses showed that very similar results were obtained after correcting for unreliability of measurement.

In the MANOVA, the main effect for culture was statistically significant (Wilks's Lambda = .59), $F(35, 5,656) = 21.40$, $p < .01$, and there were no main or interaction effects involving gender. Follow-up ANOVAs revealed significant cultural differences for each of the five need composites (range of $F[7, 1,348]$ statistics = 12.81 to 58.02, $p < .01$). Table 2 shows the cultural means and standard deviations, the effect sizes (partial η^2 values), and the results of Tukey tests on the means. Means that share the same subscript were not significantly different.

Cultural effects were largest for two of the SDT needs, autonomy and competence, followed by the self-actualization need. For these three needs, a fairly consistent pattern of cultural differences was observed with participants in the Asian cultures (Japan, China, Malaysia, and the Philippines) reporting lower need satisfaction than participants in the Americas (United States, Mexico, and Venezuela), and with Australia a less definitive member of either cultural grouping.[4] Cultural differences in need satisfaction for SDT relatedness ($\eta_p^2 = .08$) and for pleasure-stimulation ($\eta_p^2 = .06$) were smaller, and not clearly interpretable in terms of the cultural dimensions addressed in the study. In particular, we did not find consistent support for our expectation that relatedness needs would be perceived as better satisfied in collectivistic cultures (e.g., China) than in individualistic cultures (e.g., Australia). However, our expectation that relatively tight cultures (e.g., Japan, China, Malaysia) would average lower in satisfaction of autonomy needs was consistently supported.

Table 3. Cultural Differences in Well-Being Measures

Well-Being Scale	U.S.	Australia	Mexico	Venezuela	Philippines	Malaysia	China	Japan	η_p^2
Positive affect									
M	3.90c	3.54b	3.58b	3.82c	3.85c	3.58b	3.47b	2.90a	.24
SD	.46	.55	.53	.53	.50	.59	.50	.57	
Negative affect									
M	1.90a	2.07a	2.06a	2.09a	2.62c	2.40b	1.98a	2.33b	.12
SD	.53	.64	.63	.67	.60	.61	.54	.69	
MLQ-Presence									
M	4.86b	4.91b	5.36c	5.90d	4.95b	4.95b	5.08b,c	3.77a	.17
SD	1.30	1.29	1.15	1.00	.97	1.10	1.15	1.31	
MLQ-Search									
M	4.60b,c	4.59b,c	4.19b	3.64a	5.08d	5.24d	5.00c,d	4.97c,d	.10
SD	1.45	1.41	1.56	1.67	1.06	1.09	1.20	1.23	
PWB Autonomy									
M	4.19b	4.07b	4.53c	4.64c	3.48a	3.44a	3.63a	3.47a	.27
SD	.74	.83	.79	.65	.59	.57	.72	.81	
PWB Environmental Mastery									
M	4.50d,e	4.26c	4.34c,d	4.60e	3.92b	4.26c	4.30c,d	3.68a	.13
SD	.69	.89	.77	.75	.55	.57	.65	.67	
PWB Personal Growth									
M	5.06d	5.00d	4.84c,d	5.02d	4.38a	4.51a,b	4.68b,c	4.31a	.13
SD	.62	.66	.65	.65	.73	.64	.52	.73	
PWB Purpose in Life									
M	4.69c	4.63c	4.87c	5.18d	4.39b,c	4.36b	4.38b,c	3.68a	.20
SD	.74	.82	.80	.81	.62	.70	.77	.91	
PWB Positive Relations With Others									
M	4.68b	4.28a	4.62b	4.64b	4.15a	4.07a	4.67b	4.31a	.08
SD	.92	1.05	.85	.92	.88	.76	.79	.95	
PWB Self-Acceptance									
M	4.72d,e	4.45c	4.59c,d	4.97e	4.04b	3.95b	4.43b	3.57a	.22
SD	.82	.92	.81	.61	.66	.61	.69	.87	
Well-Being Component Score									
M	.54f,g	.21d,e	.47e,f	.79g	-.27b	-.22b,c	.05c,d	-.87a	.23
SD	.89	1.08	.95	.83	.75	.79	.82	.98	

Note: MLQ = Meaning in Life Questionnaire; PWB = psychological well-being. Means that share the same subscript were not significantly different in follow-up Tukey tests. η_p^2 = effect size (partial eta²) in follow-up ANOVAs.

Well-being. To compare well-being across cultures, we conducted a MANOVA with culture and gender as independent variables and the hedonic and eudaimonic well-being scales as dependent variables. A MACS analysis produced very similar results, so we report only the MANOVA results in Table 3. The main effect for culture was statistically significant (Wilks's Lambda = .34), $F(70, 7,797) = 22.91$, $p < .01$. With our large sample size, the gender main effect (Wilks's Lambda = .95), $F(19, 1,336) = 6.96$, $p < .01$, and the Culture × Gender interaction effect (Wilks's Lambda = .92), $F(70, 7,797) = 1.55$, $p < .01$, were also statistically significant. However, in follow-up ANOVAs, the gender effects were very modest in size ($\eta_p^2 \leq .02$), so we did not consider gender further.

Although not all of the differences were statistically significant, most of the measures of eudaimonic well-being showed a similar pattern of cultural differences. For the PWB Autonomy, Personal Growth, Purpose in Life, and Self-Acceptance scales, the four Asian cultures averaged lower than the non-Asian cultures, including Australia. This pattern also held for PWB Environmental Mastery, with the exception of the Australian sample. Conversely, for the MLQ-Search scale, which can be viewed as an inverse indicator of well-being, all four Asian cultures averaged *higher* than the four non-Asian cultures. As was the case for SDT relatedness, the effect size for the PWB Positive Relations With Others scale was relatively modest, and collectivistic cultures did not consistently average higher than individualistic cultures. The cultural differences for the remaining well-being scales (i.e., Positive Affect, Negative Affect, MLQ-Presence) could not be interpreted in terms of the cultural dimensions in this study. Finally, in an ANOVA with the well-being component score, the main effect for culture was large and statistically significant, $F(7, 1,376) = 59.12$, $p < .01$, $\eta_p^2 = .23$. Consistent with the pattern observed for most of the eudaimonic well-being scales, the four Asian cultures averaged lower than the four non-Asian cultures on the well-being component score, although the difference between the Chinese and Australian samples was not statistically significant.

Mediation analyses. As noted earlier, the four Asian cultures averaged higher in dialecticism and tightness and lower in independent self-construal than the four non-Asian cultures. This suggested that some of the cultural differences in need satisfaction and well-being might be explained or mediated by cultural differences in these dimensions. We used structural equations modeling (SEM) to test for mediation effects. Culture was represented by a single dummy variable, with Asian participants coded 1 and non-Asian participants coded 0. We could test for mediation for those needs and well-being variables that exhibited the Asian versus non-Asian pattern of cultural differences. This included the autonomy, competence, and self-actualization needs; most of the eudaimonic well-being scales; and the well-being component. To simplify the mediation analysis for well-being, we conducted the SEM analysis for the well-being component only. In the SEM analyses, the measurement models for the cultural dimensions and need satisfaction constructs were the same as those used in the measurement equivalence analyses. The well-being component was modeled as an observed variable. Maximum likelihood estimation was used to estimate model parameters. We conducted each mediation analyses with and without the Australians included in the non-Asian group, because the Australian means often but not always clustered with the means of the other non-Asian cultures. The results were very similar in either case, but the mediation effects were slightly stronger when the Australians were excluded. Thus, we report the results obtained without the Australian participants.

In our initial SEM analyses, we found that both dialecticism and independent self-construal mediated the cultural differences in the three needs and well-being component. The correlation between dialecticism and independent self-construal in the combined-culture sample was -.44 ($p < .01$), raising the question of whether dialecticism and independent self-construal provide unique or redundant mediation effects. To address this question, we tested the dual mediator models shown in Figure 1. In the figure, we see that the path coefficients relating culture to dialecticism and independent self-construal were similar in size, with Asian participants, compared to non-Asian participants, averaging higher in dialecticism ($\beta = .56$, $p < .01$) and lower in independent self-construal ($\beta = -.55$, $p < .01$). In each model, the standardized path coefficients (βs) that relate dialecticism to need satisfaction or well-being were higher than those relating independent self-construals to these outcome variables. In addition, in all four models, the indirect (mediation) effects associated with dialecticism were stronger than the indirect effects associated with independent self-construal. All but one of the indirect effects were statistically significant in Sobel (1982) tests (z range = -4.17 to -11.42, $p < .01$).[5] Finally, we compared the path coefficients (βs) relating culture to the need satisfaction and well-being variables before including the two
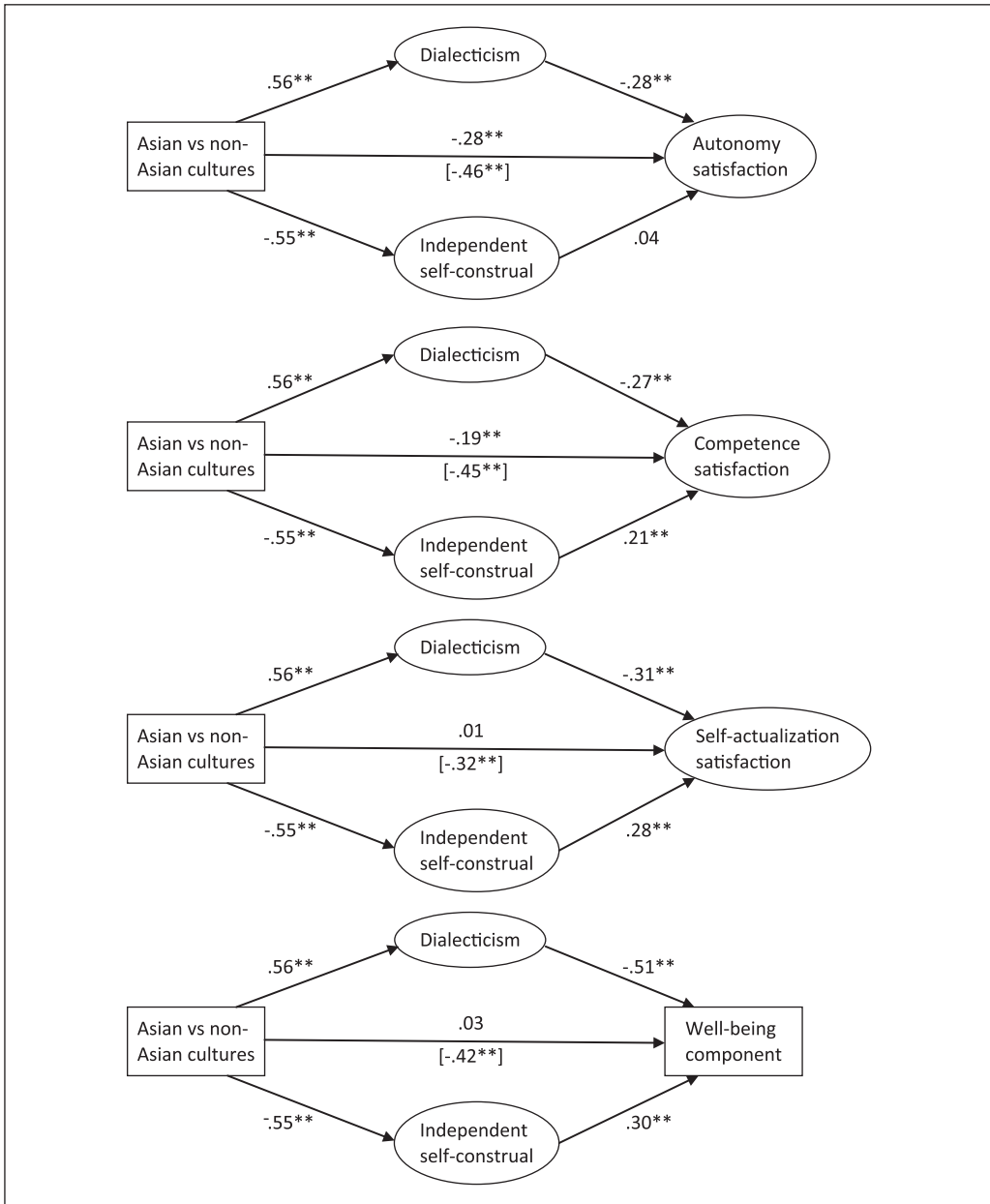
Figure 1. Summary of Selected Mediation Analyses (See Text)
Note: Measurement models for latent variables are not depicted. All path coefficients are standardized regression weights (βs).

mediators in the models (see βs in brackets in Figure 1) and after doing so. This comparison revealed that the cultural differences for the self-actualization need and the well-being component were fully mediated, while the cultural differences in autonomy and competence need satisfaction were partially mediated, by the combination of the two mediating variables.

In contrast, cultural tightness was not a strong or consistent mediator of cultural differences in need satisfaction or well-being. In the SEM models, the Asian versus non-Asian cultural distinction significantly predicted differences in cultural tightness ($\beta = .40$, $p < .01$), but only the path coefficient relating tightness to the well-being component was statistically significant ($\beta = -.09$, $p < .01$). The Sobel test indicated that the modest indirect effect was statistically significant ($z = -2.64$, $p < .01$), but the β coefficient relating culture to well-being was only slightly reduced when cultural tightness was included as a mediator in the model (-.42 vs. -.38).

In summary, a fairly recurrent pattern of cultural differences in need satisfaction and well-being was observed between the Asian and non-Asian cultures and the mediation analyses showed that both dialecticism and independent self construals made unique contributions in accounting for these cultural differences. Cultural differences in the perceived satisfaction of SDT needs are not incompatible with SDT theory as long as need satisfaction is associated with greater well-being in all cultures, which we address in the next section.

Need Satisfaction as a Predictor of Hedonic and Eudaimonic Well-Being

Support for SDT. Table 4 shows the Pearson correlations relating the need satisfaction composites to the well-being measures. SDT was supported because perceived satisfaction of SDT needs across roles was moderately correlated with most aspects of well-being in all cultures. The correlations were weaker and less consistent in the Philippines and Malaysia, where the scales were generally less reliable. To formally test for cultural differences in the overall strength of the relationship between need satisfaction and well-being, we conducted multigroup SEM analyses, which correct for unreliability of measurement. In each analysis, one of the need-satisfaction variables predicted overall well-being. The latent need-satisfaction variables were measured by participants' satisfaction ratings for that need in the five roles, and overall well-being was measured by the Positive Affect, Negative Affect, MLQ-Presence, and PWB scales. When the path coefficients (i.e., regression weights) relating the need satisfaction constructs to well-being were constrained to be equal across cultures, the model fits were all acceptable (CFI range = .89 to .90; RMSEA range = .026 to .029). In addition, constraining these path coefficients did not result in significant loss of model fit compared to models in which the path coefficients were allowed to vary across cultures (range of $\chi^2_{\text{diff}}[7] = 7.18$ to 18.14, $p > .01$; CFI differences $\leq .001$). Thus, after correcting for unreliability of measurement, the eight cultures did not differ significantly in the strength of the relationship between need satisfaction and overall well-being.[6]

Hypothesized independent contributions of SDT needs. SDT also predicts that each SDT need will provide unique prediction of well-being, because all three needs are viewed as independently necessary for self-fulfillment. To test this prediction, we regressed each of the well-being scales onto the three SDT needs simultaneously in each culture. In the analyses for the individual well-being scales, generally one or two, but not all three, SDT needs provided unique prediction. Illustrative results are presented in Table 5, which shows the β coefficients from the analysis involving the well-being component (see first row for each culture). In six of the eight cultures, two SDT needs, but not all three, provided unique prediction of the well-being component score. This might reflect, in part, the moderately high correlations between the satisfaction ratings for the three SDT needs, which ranged from about .25 to .55 in most cultures, although the size of the correlations indicates that participants were able to distinguish the SDT needs in their satisfaction ratings. When we regressed the well-being measures onto all five need composites, satisfaction of self-actualization needs often contributed more unique prediction of well-being than did the SDT needs. In Table 5, the β coefficients in the second row for each culture are again illustrative. In five of the eight cultures, self-actualization provided the most unique prediction of the well-being component, and in Japan satisfaction of pleasure-stimulation needs contributed

Table 4. Correlations Relating Need Satisfaction Composites to Measures of Well–Being

Need	PA	NA	MLQ–P	MLQ–S	Autonomy	Environmental Mastery	Personal Growth	Purpose in Life	Positive Relations	Self–Acceptance	Well–Being Component
United States											
Autonomy	.09	−.11	.04	−.01	.22**	.17*	.23**	.23**	.04	.18*	.18*
Competence	.21**	.17*	.26**	−.04	.33**	.34**	.29**	.29**	.08	.34**	.36**
Relatedness	.32**	−.40**	.22**	−.09	.14	.37**	.16*	.20	.42**	.34**	.40**
Self–actualization	.37**	−.34**	.29**	−.11	.17*	.40**	.32**	.30**	.31**	.37**	.45**
Pleasure–stimulation	.21**	−.18*	.22**	.08	.14	.22**	.19*	.11	.27**	.17*	.26**
Australia											
Autonomy	.13	−.21*	.05	.02	.41**	.24**	.09	.19*	.08	.18*	.23*
Competence	.27**	−.32**	.13	−.07	.42**	.44**	.19*	.33**	.31**	.36**	.40**
Relatedness	.37**	−.39**	.25**	−.12	.18	.39**	.20*	.36**	.62**	.49**	.48**
Self–actualization	.55**	−.39**	.46**	−.16	.30**	.46**	.38**	.49**	.55**	.55**	.60**
Pleasure–stimulation	.51**	−.39**	.27**	−.11	.27**	.40**	.27**	.35**	.62**	.50**	.52**
Mexico											
Autonomy	.41**	−.16*	.34**	−.14	.36**	.44**	.39**	.39**	.07	.35**	.45**
Competence	.45**	−.10	.32**	−.18*	.36**	.45**	.41**	.40**	.07	.36**	.45**
Relatedness	.33**	−.08	.28**	−.10	.20*	.34**	.17*	.29**	.11	.19*	.31**
Self–actualization	.43**	−.25**	.45**	−.27**	.32**	.50**	.32**	.44**	.26**	.41**	.52**
Pleasure–stimulation	.45**	−.15	.41**	−.13	.28**	.46**	.34**	.41**	.17*	.32**	.47**
Venezuela											
Autonomy	.06	−.24*	.23*	−.20	.44**	.26*	.30**	.24*	.31**	.42**	.41**
Competence	.20	−.34**	.28**	−.27**	.44**	.39**	.33**	.39**	.37**	.48**	.57**
Relatedness	.12	−.13	.28**	−.30**	.47**	.26*	.39**	.42**	.49**	.40**	.47**
Self–actualization	.30**	−.33**	.38**	−.21*	.42**	.51**	.39**	.54**	.47**	.47**	.62**
Pleasure–stimulation	.27**	−.27**	.26*	−.17	.41**	.41**	.40**	.41**	.44**	.39**	.54**
Philippines											
Autonomy	.25**	−.05	.10	.10	.09	.16*	.05	.08	.05	.10	.15
Competence	.27**	−.12	−.04	.10	.12	.24**	.21**	.20**	.19*	.27**	.27**
Relatedness	.27**	−.12	−.03	−.03	.07	.21**	.12	.14	.23**	.22**	.23**
Self–actualization	.25**	−.07	.05	.09	.00	.31**	.22**	.26**	.19*	.27**	.29**
Pleasure–stimulation	.29**	−.14	.04	−.03	−.05	.24**	.14	.16*	.27**	.20**	.24**
Malaysia											
Autonomy	.16**	−.10	.07	−.07	.05	.16*	.08	.17**	.21**	.15*	.18**
Competence	.41**	−.13*	.23**	.08	.13*	.33**	.29**	.37**	.15*	.25**	.37**
Relatedness	.31**	−.10	.24**	.07	.05	.30**	.15*	.28**	.13*	.24**	.30**
Self–actualization	.41**	−.09	.29**	.06	.06	.29**	.21**	.33**	.11	.23**	.33**
Pleasure–stimulation	.32**	−.11	.21**	.03	−.04	.23**	.09	.22**	.16**	.18**	.24**
China											
Autonomy	.27**	−.24**	.22**	−.01	.20**	.25**	.17*	.24**	.16*	.21**	.31**
Competence	.34**	−.20**	.20**	−.06	.18**	.25**	.07	.19**	.22**	.29**	.31**
Relatedness	.40**	−.33**	.24**	−.02	.17*	.27**	.15*	.28**	.31**	.29**	.39**
Self–actualization	.42**	−.24**	.26**	−.11	.15*	.31**	.16*	.32**	.24**	.36**	.40**
Pleasure–stimulation	.44**	−.24**	.20**	−.09	.18**	.27**	.18**	.28**	.20**	.27**	.36**
Japan											
Autonomy	.23**	−.04	.11	.15*	.13	.12	.25**	.27**	.20**	.21**	.25**
Competence	.35**	−.08	.27**	.18*	.22**	.33**	.28**	.32**	.29**	.34**	.41**
Relatedness	.48**	−.27**	.27**	.16*	.07	.42**	.24**	.29**	.55**	.31**	.47**
Self–actualization	.53**	−.10	.39**	.19**	.11	.41**	.33**	.41**	.36**	.30**	.46**
Pleasure–stimulation	.53**	−.29**	.29**	.12	.03	.43**	.32**	.37**	.53**	.33**	.49**

Note: PA = Positive Affect; NA = Negative Affect; MLQ–P = Meaning in Life Questionnaire–Presence; MLQ–S = Meaning in Life Questionnaire–Search.
p < .05. **p* < .01.

Table 5. Unique Contributions (βs) of Need Composites in Predicting the Well–Being Component

	Autonomy	Competence	Relatedness	Self–Actualization	Pleasure–Stimulation	R^2
United States						
SDT needs only	−.02	.27**	.32**	—	—	.22**
All five needs	−.05	.21*	.24**	.31**	−.10	.28**
Australia						
SDT needs only	.13	.22*	.42**	—	—	.26**
All five needs	.03	.15	.09	.37**	.15	.41**
Mexico						
SDT needs only	.26**	.27**	.07	—	—	.26**
All five needs	.17	.14	−.12	.29**	.18	.34**
Venezuela						
SDT needs only	−.05	.40**	.31**	—	—	.34**
All five needs	−.10	.18	.17	.36**	.12	.43**
Philippines						
SDT needs only	.06	.20**	.10	—	—	.09**
All five needs	.07	.15	−.01	.19	.04	.11**
Malaysia						
SDT needs only	.02	.29**	.14*	—	—	.15**
All five needs	.02	.24**	.07	.13	.03	.16**
China						
SDT needs only	.14	.12	.30**	—	—	.20**
All five needs	.10	.08	.21**	.18*	.05	.22**
Japan						
SDT needs only	−.02	.24**	.35**	—	—	.25**
All five needs	−.04	.15	.14	.16	.23*	.31**

Note: SDT = Self–Determination Theory. βs are from multiple regression analyses in which either three SDT needs or all five need composites simultaneously predicted the well–being component.
*$p < .05$. **$p < .01$.

the most unique prediction. These results are not incompatible with SDT, which does not directly address self-actualization and pleasure-stimulation needs, but they show that additional needs may be as important as SDT needs in the prediction of well-being and other outcomes.

Hedonic versus eudaimonic well-being. Finally, we did not find that satisfaction of hedonic needs (i.e., pleasure-stimulation) was a better predictor of hedonic well-being (i.e., positive and negative affect) than eudaimonic well-being, nor that satisfaction of eudaimonic needs was always a better predictor of eudaimonic well-being than hedonic well-being (see correlations in Table 4). The likelihood of observing differential links between specific needs and specific aspects of well-being was probably reduced by (a) the moderate correlations between the five need composite scores, which ranged from about .25 to .70 in each culture, and (b) the fairly high correlations between some well-being indicators, which ranged from about .20 to .70 in each culture. However, in our multiple regression analyses, we did observe two cases of differential prediction involving eudaimonic needs and well-being. In seven of the eight cultures, perceived satisfaction of self-actualization needs across roles provided more unique prediction of MLQ-Presence (range of βs = .17 to .58) and PWB Purpose in Life (range of βs = .20 to .48) than did the other needs. In five of the eight cultures, satisfaction of SDT relatedness needs across roles provided the most unique prediction of scores on the PWB Positive Relations With Others scale (range of βs = .24 to .35).

In summary, these results indicate that satisfaction of SDT needs (and needs for self-actualization and pleasure-stimulation) predict aspects of both hedonic and eudaimonic well-being in all cultures. Indeed, after controlling for unreliability of measurement, no reliable cultural differences were found in the ability of the needs to predict overall well-being. These results support SDT. However, the three SDT needs did not all provide independent prediction of the well-being indicators, and there was no strong tendency for satisfaction of hedonic and eudaimonic needs to differentially predict hedonic and eudaimonic well-being, respectively.

Controlling for the Big Five traits. As noted earlier, it is important to determine whether need satisfaction across roles provides incremental prediction of hedonic or eudaimonic well-being beyond the Big Five traits. To address this question, we conducted hierarchical regression analyses in which each well-being measure was regressed onto the Big Five traits in Step 1 and the five need-satisfaction composites in Step 2. In all eight cultures, one or more Big Five traits significantly predicted each of the well-being measures in Step 1. The results in Table 6, which summarize the results for the well-being component, are illustrative. As seen in the table, the Big Five traits accounted for 20% to 52% of the variance in the well-being component across cultures (see Step 1 ΔR^2 values). Consistent with previous research (e.g., Schmutte & Ryff, 1997), Extraversion, Conscientiousness, and Emotional Stability were generally the strongest and most consistent Big Five predictors of the well-being component and the individual well-being indicators.

More importantly, in six of the eight cultures, satisfaction of one or more needs provided incremental prediction of the majority of the individual well-being measures. In the remaining two cultures, Malaysia and Japan, incremental prediction was observed for four of the nine individual well-being measures. As illustrated in Table 6 for the well-being component, satisfaction of self-actualization needs provided incremental prediction of the various well-being measures in more cultures than the SDT needs did. Satisfaction of SDT relatedness needs provided modest incremental prediction of the individual well-being measures fairly frequently, whereas satisfaction of SDT competence needs and pleasure-stimulation needs provided incremental prediction somewhat less frequently. Satisfaction of SDT autonomy needs rarely contributed incremental prediction beyond the Big Five traits in the context of the other needs. Overall, the results showed that satisfaction of SDT and other needs can contribute modest incremental prediction of well-being beyond the Big Five traits in a diversity of cultures.

Need Balance and Well-Being

To test Sheldon and Niemiec's (2006) proposal that greater need balance will lead to greater well-being, we adopted their procedure to derive an index of need imbalance. For each participant, we computed the absolute value of the difference between his or her satisfaction ratings for each pair of needs in a given role (e.g., |autonomy rating – competence rating|). There were 10 pair-wise differences between needs for each role, or a total of 50 across the five roles, which we averaged to obtain a single need imbalance score for each participant. In an ANOVA with culture and gender as independent variables and the need imbalance score as a dependent variable, we found a very small but significant culture effect, $F(7, 1,348) = 2.90$, $p < .01$, $\eta_p^2 = .02$, and no main or interaction effects involving gender. In follow-up Tukey tests, the only significant cultural differences involved Australian participants, who averaged higher in need imbalance than participants in four of the other seven cultures (i.e., Malaysia, Mexico, Japan, and Venezuela). Thus, cultural differences in need imbalance were very modest and did not conform to any pattern associated with the cultural dimensions assessed in the study.

More importantly, in six of the eight cultures (all but Venezuela and Malaysia), the need imbalance score was significantly, albeit modestly, related to negative affect (range of rs = .14 to .22, $p < .05$). Need imbalance was also significantly correlated with the well-being component in

Table 6. Summary of Hierarchical Regression Results Predicting Well-Being Component From Big Five Traits (Step 1) and Need Satisfaction Composites (Step 2)

| Country | Step 1 ΔR^2 | Big Five | | Step 2 ΔR^2 | Need | |
		Predictor	β		Predictor	β
United States	.42**	Extraversion	.37**	.10**	Competence	.19**
		Conscientiousness	.20**		Relatedness	.17**
		Emotional Stability	.26**			
Australia	.47**	Conscientiousness	.31**	.16**	Self-Actualization/Meaning	.35**
		Emotional Stability	.36**			
Mexico	.39**	Extraversion	.20**	.11**	Self-Actualization/Meaning	.20*
		Agreeableness	−.14*			
		Conscientiousness	.17*			
		Emotional Stability	.32**			
		Openness	.18**			
Venezuela	.20**	Openness	.18†	.28**	Self-Actualization/Meaning	.40**
Philippines	.36**	Extraversion	.37**	.05*	Self-Actualization/Meaning	.18*
		Conscientiousness	.29**			
		Emotional Stability	.21**			
Malaysia	.30**	Extraversion	.26**	.04**	Competence	.14†
		Conscientiousness	.20**			
		Emotional Stability	.17**			
China	.52**	Extraversion	.18**	.05*	Self-Actualization/Meaning	.14*
		Conscientiousness	.33**			
		Emotional Stability	.20**			
		Openness	.15*			
Japan	.50**	Extraversion	.35**	.06**	—[a]	—
		Conscientiousness	.20**			
		Emotional Stability	.19**			
		Openness	.20**			

a. Although the five needs together provided incremental prediction in Japan, the βs for the individual needs were not statistically significant.
†*p* < .10. **p* < .05. ***p* < .01.

the United States, Australia, Mexico, and Venezuela (range of *r*s = -.19 to -.29, *p* < .05) and marginally so in the Philippines (*r* = -.14, *p* < .08) and Malaysia (*r* = -.10, *p* < .09). Need imbalance also correlated significantly with a few additional well-being scales but less consistently across cultures. These findings indicate that greater need imbalance is associated to some extent with poorer well-being, particularly negative affect.[7]

Discussion

The present study added to cross-cultural research on SDT in several ways. First, the number and diversity of cultures sampled was greater than in most previous studies (see, however, Sheldon et al., 2011). Second, in contrast to trait-like measures, which assess need satisfaction in general, we used a more contextual measure of SDT need satisfaction, which assessed satisfaction of needs in specific roles or relationships. Third, we directly measured the cultural dimensions that were hypothesized to account for cultural differences in need satisfaction and

well-being. Fourth, we examined the impact of SDT need satisfaction and need imbalance on both hedonic and eudaimonic well-being. Fifth, we investigated the incremental validity of SDT needs, beyond the Big Five traits, as predictors of well-being. Most of our findings provided support for SDT. They also contribute to the literature on cultural differences in need satisfaction and well-being.

Cultural Differences in Need Satisfaction and Well-Being

A few studies have found cultural differences in perceived satisfaction of SDT needs. However, the studies have not produced a consistent pattern of differences that can be explained in terms of the cultural dimensions investigated by cultural psychologists. Levesque et al. (2004) and Chirkov and Ryan (2001) found cultural differences in perceived support for some SDT needs but did not include measures of possible mediators of these cultural differences. Chirkov et al. (2005) included measures of individualism and collectivism in their comparison of Brazilians and Canadians, but some of their results were difficult to interpret in terms of these dimensions. For example, Brazilians, compared to Canadians, reported lower perceived autonomy support from parents and teachers, but the two cultural groups did not differ in perceived individualism and the Brazilians perceived their culture to be less collectivistic than did the Canadians.

In contrast, the cultural differences in need satisfaction found in the present study were largely consistent with cultural psychology expectations and were largely accounted for by the cultural dimensions in the study. Perceived satisfaction of autonomy, competence, and self-actualization needs was lower in the Asian cultures than in the non-Asian cultures (including Australia in the case of autonomy), and our mediation analyses indicated that the Asian participants' lower need satisfaction was accounted for, in full or in part, by their greater dialecticism and lower independent self-construals.

Our predictions regarding cultural differences in need satisfaction were largely inferred from the more extensive literature on cultural differences in well-being, in which lower dialecticism (or non–East Asian cultural membership) and greater individualism have been associated with greater self-esteem and hedonic well-being (Boucher et al., 2009; Diener & Diener, 1995; Diener et al., 1995; Hamamura et al., 2008; Heine et al., 1999; Heine & Lehman, 1997; Lee & Seligman, 1997; Sheldon et al., 2011; Spencer-Rodgers et al., 2004). Our finding that participants in the Asian cultures averaged lower on most of the measures of eudaimonic well-being and the well-being component was consistent with these studies, and our mediation analyses again supported an interpretation in terms of dialecticism and independent self-construals.

As argued by Spencer-Rodgers et al. (2004), individuals or cultural groups characterized by higher dialecticism acknowledge and accept psychological contradictions, which apparently leads to greater evaluative ambivalence in their self-appraisals and evaluations of happiness. Individuals with stronger independent self-construals may attain greater need satisfaction and well-being by pursuing their personal goals and interests (Diener et al., 1995). In addition, they may be more motivated to evaluate their need satisfaction and personal well-being positively because such attributes are central to their identities (Heine & Hamamura, 2007; Markus & Kitayama, 1998). In contrast, a plausible explanation for the failure of the cultural tightness dimension to mediate cultural differences in need satisfaction and well-being is the following: Unlike the dialecticism and self-construal measures, which required participants to rate their personal dialecticism and self-construals, the tightness measure asked participants to rate the tightness of their society as a whole, rather than their personal conformity to normative behavior.

Need Satisfaction as a Predictor of Well-Being

Support for SDT. Cultural differences in the satisfaction of SDT needs are not incompatible with SDT as long as SDT need satisfaction is associated with well-being in all cultures. Consistent with SDT, we found that perceived satisfaction of SDT needs—as well as needs for self-actualization and pleasure-stimulation—was moderately related to most aspects of well-being in all cultures. Indeed, after controlling for measurement error, satisfaction of each need predicted overall well-being equally well in each culture. Thus, although some researchers have questioned whether SDT needs are cultural universals (Cross & Markus, 1999; Iyengar & Lepper, 1999; Miller, 1997), we did not find significant cultural differences in the impact of SDT needs on well-being. Our results are consistent with the findings of other studies that have found cross-cultural support for SDT using different measures of need satisfaction (Chirkov & Ryan, 2001; Chirkov et al., 2003, 2005; Levesque et al., 2004; Sheldon et al., 2011). We extended this support to several cultures that had not yet been investigated, or rarely so, including Australia, Mexico, Venezuela, the Philippines, Malaysia, China, and Japan (Sheldon et al.'s [2011] investigation also included Mexican and Chinese samples). Our results cannot directly address the proposed evolved and adaptive nature of SDT needs. However, our findings are consistent with the proposition that SDT needs represent "part of the common architecture of human nature" (Deci & Ryan, 2000, p. 252).

Whether there are systematic cultural differences in the strength of the relationship between SDT need satisfaction and well-being remains unclear because available studies have shown mixed results. As in the present study, some studies have reported minimal or no cultural differences in the strength of the relationship between need satisfaction and well-being (Chirkov & Ryan, 2001; Chirkov et al., 2003; Levesque et al., 2004; Tay & Diener, 2011). Other studies have found differences in the strength of the relationship, but no consistent pattern of cultural differences has emerged (Chirkov et al., 2005; Deci et al., 2001; Sheldon et al., 2001, 2011). Diener and Diener (1995) and Oishi et al. (1999) reported a replicated finding with self-esteem needs. In both studies, satisfaction of self-esteem needs was more strongly associated with life satisfaction in individualistic cultures than in collectivistic cultures. Self-esteem needs may be more consistently and directly associated with individualism than the needs assessed in the current study, including SDT needs. Further research is needed to determine whether systematic cultural differences in the strength of the relationship between SDT need satisfaction and well-being can be identified and explained. In some cases, the strength of the relationship may reflect the extent to which the needs are typically met in the respective cultures. For example, Sheldon et al. (2011) found that the relationship between autonomy satisfaction and well-being was actually weaker in individualistic cultures. They speculated that this finding might reflect a deprivation model of needs, in which the importance of a need is amplified in cultures that are not conducive to its satisfaction.

Hypothesized independent contributions of SDT needs. Our findings did not support the SDT proposition that all three SDT needs provide independent contributions in the prediction of well-being (Deci & Ryan, 2000). Generally one or two, but not all three, SDT needs contributed independent prediction of well-being. Although the moderate correlations between the SDT need composites may have contributed to this finding, the correlations were comparable in size to those reported in other studies that did find independent prediction of well-being by all three SDT needs (Deci et al., 2001; Sheldon & Niemiec, 2006).

Some single-culture studies have found independent prediction of well-being by multiple SDT needs (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon & Nemiec, 2006; Sheldon, Ryan, & Reis, 1996). However, most cross-cultural studies have not tested this hypothesis because the researchers studied only autonomy (Chirkov et al., 2003, 2005; Chirkov & Ryan,

2001; Sheldon et al., 2004) or analyzed a composite of the three needs rather than treating them separately (Deci et al., 2001). There is some cross-cultural or non-Western evidence that the SDT needs can provide independent prediction of various well-being indicators (Levesque et al., 2004; Sheldon et al., 2001, 2011; Vansteenkiste, Lens, Soenens, & Luyckx, 2006), but the results of the present study indicate that this will not always be the case. Additional studies may clarify the conditions under which SDT needs provide independent prediction and when they might best be scored as a single composite.

Another finding of interest was that satisfaction of self-actualization needs provided more consistent independent prediction of the well-being component than did the SDT needs. On one hand, this finding might suggest that other needs besides SDT needs may be just as predictive of well-being and other outcomes, and in some cases more so. On the other hand, this finding is not inconsistent with SDT and may reflect the fact that self-actualization tendencies are facilitated by conditions that fulfill SDT needs (Ryan, 1995). In this view, an alternative, but more complex, approach in the present study would have been to treat satisfaction of self-actualization needs as a mediator between SDT need satisfaction and the various well-being indicators.

Hedonic versus eudaimonic well-being. We did not find a consistent tendency for satisfaction of hedonic and eudaimonic needs to be differentially related to hedonic and eudaimonic well-being, respectively. One likely reason was that the hedonic and eudaimonic well-being scales shared substantial variance, as revealed, for example, by the identification of a general well-being component in each culture. King, Hicks, Krull, and Del Gaiso (2006) also found that assessments of positive and negative affect were strongly related to assessments of meaning in life and concluded that "the lines between hedonic pleasure and more 'meaningful pursuits' should not be drawn too rigidly" (p. 191). Keyes et al. (2002) conducted confirmatory factor analyses to examine whether hedonic well-being, as measured by positive affect, negative affect, and life satisfaction, can be distinguished from eudaimonic well-being, as measured by the six PWB scales. Of the two best fitting models, one represented hedonic and eudaimonic well-being as distinct constructs, but the correlation between them was very high ($r = .84$). The second model allowed two PWB scales to load on both hedonic and eudaimonic well-being and still showed a correlation of .70 between the two types of well-being.

It is clear from these studies that the two types of well-being, although conceptually distinguishable, are strongly related, making it challenging to identify differential predictors. This may explain why researchers have often analyzed composites of the two types of measures rather than analyzing them separately (Chirkov & Ryan, 2001; Chirkov et al., 2003, 2005; Levesque et al., 2004). Nonetheless, there are still potential advantages in including both hedonic and eudaimonic well-being measures in cross-cultural studies because they might sometimes relate differently to particular outcomes. For example, in the present study, need imbalance was most related to negative affect, whereas interpretable cultural differences in well-being were mainly limited to the eudaimonic well-being scales.

Incorporating the Big Five traits. A limitation of most cross-cultural studies of SDT has been the failure to control for personality traits when predicting well-being from SDT need satisfaction. The practical importance of SDT needs in predicting well-being and other outcomes will depend on whether they contribute incremental prediction beyond the Big Five traits. Given the strong relationship between the Big Five traits and well-being, our analysis provided a stringent test of the applied importance of the need variables. Thus, it was encouraging that in most cultures need satisfaction did contribute modest to moderate incremental prediction of the well-being measures. The direction of causality between SDT needs and the Big Five traits cannot be determined from correlational data. In Five Factor theory (McCrae & Costa, 2008), individual differences in perceptions of need satisfaction would be viewed as characteristic adaptations that are influenced by basic tendencies—including the Big Five traits—plus environmental factors such as culture

(see also Olesen, 2011). Conversely, within-individual variability in the Big Five traits across various relationships or roles could be viewed as an outcome of variations in SDT need satisfaction (Church et al., 2012; Lynch et al., 2009; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997).

Need Imbalance and Well-Being

We extended Sheldon and Niemiec's (2006) work by testing the need balance hypothesis in multiple cultures and in relation to both hedonic and eudaimonic well-being. Our findings were similar to those of Sheldon and Niemiec. Although need imbalance modestly predicted the well-being component score, the most consistent correlate across cultures was negative affect, an aspect of hedonic well-being. A plausible interpretation is that individuals who feel less able to satisfy each of their needs to a similar extent in particular relationships experience a degree of conflict, which in turn contributes to greater negative affect. Although the effects were modest, as they were in Sheldon and Niemiec's study, the need balance construct is worth investigating further in additional cultures.

Limitations

There were several limitations of the study. One was our sampling of only college students. Cross-cultural support for SDT has not been limited to college students (e.g., adolescents in Chirkov & Ryan, 2001; working adults in Deci et al., 2001). Nonetheless, replication of our results in additional and broader samples would be beneficial. In addition, although the implied direction of causality in the study (i.e., need satisfaction predicts well-being) is consistent with SDT, the direction of causality remains ambiguous in correlational data. Similarly, while we treated both hedonic and eudaimonic well-being as outcomes of SDT needs, it is also possible to view eudaimonic activities and well-being as ways of living that lead to hedonic well-being (e.g., Ryan, Huta, & Deci, 2008; Steger et al., 2008). A few of the measures were less reliable in certain cultures, but we addressed this limitation by using MACS and SEM analyses to correct for unreliability of measurement. Only partial scalar equivalence (but full metric equivalence) was demonstrated for the need satisfaction and well-being measures, but the rather consistent pattern of cultural mean differences reduced this concern. Furthermore, our tests of measurement equivalence were more stringent than typically conducted in cross-cultural research. Sheldon et al.'s (1997) need definitions were useful for our purposes in obtaining role-specific need satisfaction ratings. However, our results might not fully replicate using alternative measures of SDT needs. Finally, response styles are a potential confounding factor in cross-cultural research. The role-specific need satisfaction scales were unipolar, but the PWB scales contained both positive and reverse-keyed items. Since the cultures exhibited a similar pattern of differences on these two types of scales, acquiescence was probably not a significant confounding factor in the cultural comparisons. The ability of the dialecticism and independent self-construal measures to mediate these cultural differences also suggests that the cultural differences were valid and meaningful.

Conclusion

Individuals in different cultures vary, on average, in their perceptions of need satisfaction and well-being. Nonetheless, perceived need satisfaction can have a similar positive impact on well-being across cultures. Our findings are consistent with the SDT proposition that needs for autonomy, competence, and relatedness (as well as self-actualization and pleasure-stimulation) are universally important for self-fulfillment and well-being. From an applied perspective, the findings suggest that interventions that facilitate need satisfaction can benefit mental health around the world.

Notes

1. When we repeated the analyses of cultural differences in need satisfaction and well-being with only the European American participants in the U.S. sample and the Anglo-Australian participants in the Australian sample, the results did not change. Therefore, we retained the small number of ethnic minority participants in these two samples.
2. We thank Julie Spencer-Rodgers for providing the Chinese translation of the DSS.
3. We thank Michele J. Gelfand for permission to adapt the cultural tightness-looseness measure.
4. This pattern generally held as well when we examined cultural differences in perceived satisfaction of these three needs for each of the five roles separately. Thus, the cultural differences observed with the need composites were not an artifact of cultural differences in particular roles.
5. The indirect effects can be computed by multiplying the unstandardized path coefficients (i.e., regression weights) relating culture to the relevant mediator by the unstandardized path coefficient relating the mediator to the need satisfaction or well-being outcome variable. The size of the indirect effects involving dialecticism and independent self-construal were as follows: for autonomy, -.15 versus -.02; for competence, -.17 versus -.13; for self-actualization, -.18 versus -.16; and for well-being, -.60 versus -.34. These indirect (mediation) effects were all statistically significant with one exception: Independent self-construal did not mediate cultural differences in perceived satisfaction of autonomy needs.
6. Recall that we did not include the MLQ-Search scale in the well-being component score because it measures the search for, rather than presence of, meaning in life. Indeed, as seen in Table 4, in most cultures, the need composites were uncorrelated or negatively correlated with MLQ-Search scores. The exception involved Japan, where the need composites were positively correlated with MLQ-Search scores, albeit modestly. This result resembles a finding by Steger et al. (2008), who reported that subjective happiness was negatively related to MLQ-Search scores in their American sample, but positively related to MLQ-Search scores in their Japanese sample. Although beyond the scope of the present study, these findings suggest that the search for meaning may be viewed as more desirable or healthy in some cultures (e.g., Japan) than others.
7. In hierarchical regression analyses, we also found that in some cultures, need imbalance provided incremental prediction of negative affect and well-being beyond overall levels of need satisfaction and the Big Five traits. However, incremental prediction was generally modest and not very consistent across cultures (range of βs = .14 to .29 for negative affect; -.14 to -.24 for overall well-being).

References

Allport, G. W. (1955). *Becoming: Basic considerations for a psychology of personality*. New Haven, CT: Yale University Press.

Boucher, H. C., Peng, K., Shi, J., & Wang, L. (2009). Culture and implicit self-esteem: Chinese are "good" and "bad" at the same time. *Journal of Cross-Cultural Psychology*, *40*, 24-45.

Chirkov, V. I., & Ryan, R. M. (2001). Parent and teacher autonomy-support in Russian and U.S. adolescents: Common effects on well-being and academic motivation. *Journal of Cross-Cultural Psychology*, *32*, 618-635.

Chirkov, V., Ryan, R. M., Kim, Y., & Kaplan, U. (2003). Differentiating autonomy from individualism and independence: A self-determination theory perspective on internalization of cultural orientations and well-being. *Journal of Personality and Social Psychology*, *84*, 97-110.

Chirkov, V. I., Ryan, R. M., & Willness, C. (2005). Cultural context and psychological needs in Canada and Brazil: Testing a self-determination approach to the internalization of cultural practices, identity, and well-being. *Journal of Cross-Cultural Psychology*, *36*, 423-443.

Church, A. T. (2010). Measurement issues in cross-cultural research. In G. Walford, M. Viswanathan, & E. Tucker (Eds.), *The Sage handbook of measurement* (pp. 151-177). Thousand Oaks, CA: Sage Publications.

Church, A. T., Alvarez, J. M., Katigbak, M. S., Mastor, K. A., Cabrera, H. F., & Tanaka-Matsumi, J., *et al*. (2012). Self-concept consistency and short-term stability in eight cultures. *Journal of Research in Personality, 46,* 556-570. doi: 10.1016/j.jrp.2012.06.003.

Church, A. T., Katigbak, M. S., del Prado, A. M., Ortiz, F. A., Mastor, K. A., Harumi, Y., & Cabrera, H. F. (2006). Implicit theories and self-perceptions of traitedness across cultures: Toward integration of cultural and trait psychology perspectives. *Journal of Cross-Cultural Psychology*, *37*, 694-716.

Church, A. T., Ortiz, F. A., Katigbak, M. S., Avdeyeva, T. V., Emerson, A. M., Vargas-Flores, J. D., & Ibáñez-Reyes, J. (2003). Measuring individual and cultural differences in implicit trait theories. *Journal of Personality and Social Psychology*, *85*, 332-347.

Cross, S. E., Bacon, P. L., & Morris, M. L. (2000). The relational-interdependent self-construal and relationships. *Journal of Personality and Social Psychology*, *78*, 791-808.

Cross, S. E., & Markus, H. R. (1999). The cultural constitution of personality. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 378-396). New York: Guilford.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227-268.

Deci, E. L., & Ryan, R. M. (2008). Hedonia, eudaimonia, and well-being: An introduction. *Journal of Happiness Studies*, *9*, 1-11.

Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former eastern bloc country: A cross-cultural study of self-determination. *Personality and Social Psychology Bulletin*, *27*, 930-942.

Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology*, *68*, 653-663.

Diener, E., Diener, M., & Diener, C. (1995). Factors predicting the subjective well-being of nations. *Journal of Personality and Social Psychology*, *69*, 851-864.

Epstein, S. (1990). Cognitive-experiential self-theory. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 165-192). New York: Guilford Press.

Gelfand, M. J., Nishii, L. H., & Raver, J. L. (2006). On the nature and importance of cultural tightness-looseness. *Journal of Applied Psychology*, *91*, 1225-1244.

Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., & Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. *Science*, *332*, 1100-1104.

Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment*, *4*, 26-42.

Hamamura, T., Heine, S. J., & Paulhus, D. L. (2008). Cultural differences in response styles: The role of dialectical thinking. *Personality and Individual Differences*, *44*, 932-942.

Heine, S. J., & Hamamura, T. (2007). In search of East Asian self-enhancement. *Personality and Social Psychology Review*, *11*, 4-27.

Heine, S. J., & Lehman, D. R. (1997). The cultural construction of self-enhancement: An examination of group-serving biases. *Journal of Personality and Social Psychology*, *72*, 1268-1283.

Heine, S. J., Lehman, D. R., Markus, H. R., & Kitayama, S. (1999). Is there a universal need for positive self-regard? *Psychological Review*, *106*, 766-794.

Iyengar, S. S., & Lepper, M. R. (1999). Rethinking the value of choice: A cultural perspective on intrinsic motivation. *Journal of Personality and Social Psychology*, *76*, 349-366.

Kashima, E. S., & Hardie, E. A. (2000). The development and validation of the Relational, Individual, and Collective self-aspects (RIC) Scale. *Asian Journal of Social Psychology*, *3*, 19-48.

Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: The empirical encounter of two traditions. *Journal of Personality and Social Psychology*, *82*, 1007-1022.

Kim, M., Hunter, J. E., Miyahara, A., Horvath, A. M., Bresnahan, M., & Yoon, H. J. (1996). Individual versus culture-level dimensions of individualism and collectivism: Effects on preferred conversation styles. *Communication Monographs*, *63*, 29-49.

King, L. A., Hicks, J. A., Krull, J. L., & Del Gaiso, A. K. (2006). Positive affect and the experience of meaning in life. *Journal of Personality and Social Psychology*, *90*, 179-196.

Kishton, J. M., & Widaman, K. F. (1994). Unidimensional versus domain representative parceling of questionnaire items: An empirical example. *Educational and Psychological Measurement*, *54*, 757-765.

Kobayashi, E., Kerbo, H. R., & Sharp, S. F. (2010). Differences in individualistic and collectivistic tendencies among college students in Japan and the United States. *International Journal of Comparative Sociology*, *5*, 59-84.

Lee, Y.- T., & Seligman, M. E. P. (1997). Are Americans more optimistic than the Chinese? *Personality and Social Psychology Bulletin*, *23*, 32-40.

Levesque, C., Zuehlke, A. N., Stanek, L R., & Ryan, R. M. (2004). Autonomy and competence in German and American university students: A comparative study based on self-determination theory. *Journal of Educational Psychology*, *96*, 68-84.

Lucas, R. E., & Diener, E. (2008). Personality and subjective well-being. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 795-814). New York: Guilford.

Lynch, M. F., La Guardia, J. G., & Ryan, R. M. (2009). On being yourself in different cultures: Ideal and actual self-concept, autonomy support, and well-being in China, Russia, and the United States. *Journal of Positive Psychology*, *4*, 290-304.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*, 224-253.

Markus, H. R., & Kitayama, S. (1998). The cultural psychology of personality. *Journal of Cross-Cultural Psychology*, *29*, 63-87.

Maslow, A. (1954). *Motivation and personality*. New York: Harper & Row.

McClelland, D. (1985). *Human motivation*. Glennville, IL: Scott Foresman.

McCrae, R. R., & Costa, P. T., Jr. (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 159-181). New York: Guilford.

Miller, J. G. (1997). Cultural conceptions of duty: Implications for motivation and morality. In D. Munro, J. F. Schumaker & A. C. Carr (Eds.), *Motivation and culture* (pp. 178-192). New York: Routledge.

Morling, B., & Lamoreaux, M. (2008). Measuring culture outside the head: A meta-analysis of individualism-collectivism in cultural products. *Personality and Social Psychology Review*, *12*, 199-221.

Murray, H. (1938). *Explorations in personality*. New York: Oxford University Press.

Oishi, S., Diener, E. F., Lucas, R. E., & Suh, E. M. (1999). Cross-cultural variations in predictors of life satisfaction: Perspectives from needs and values. *Personality and Social Psychology Bulletin*, *25*, 980-990.

Olesen, M. H. (2011). General causality orientations are distinct from but related to dispositional traits. *Personality and Individual Differences*, *51*, 460-465.

Peng, K., & Nisbett, R. E. (1999). Culture, dialectics, and reasoning about contradiction. *American Psychologist*, *54*, 741-754.

Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin*, *26*, 419-435.

Rogers, C. R. (1963). Actualizing tendency in relation to "motives" and to consciousness. In M. R. Jones (Ed.), *Nebraska symposium on motivation* (pp. 1-24). Lincoln: University of Nebraska Press.

Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality*, *63*, 397-427.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*, 68-78.

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141-166.

Ryan, R. M., & Deci, E. L. (2008). Self-determination theory and the role of basic psychological needs in personality and the organization of behavior. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 654-678). New York: Guilford.

Ryan, R. M., Huta, V., & Deci, E. L. (2008). Living well: A self-determination theory perspective on eudaimonia. *Journal of Happiness Studies*, *9*, 139-170.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*, 1069-1081.

Ryff, C. D., & Singer, B. (2006). Best news yet on the six-factor model of well-being. *Social Science Research*, *35*, 1003-1119.

Saucier, G. (1994). Mini-markers: A brief version of Goldberg's unipolar big-five markers. *Journal of Personality Assessment*, *63*, 506-516.

Schmutte, P. S., & Ryff, C. D. (1997). Personality and well-being: Reexamining methods and meanings. *Journal of Personality and Social Psychology*, *73*, 549-559.

Schwartz, S. H. (2002). [Country scores for Schwartz value dimensions]. Unpublished raw data.

Sheldon, K. M., Cheng, C., & Hilpert, J. (2011). Understanding well-being and optimal functioning: Applying the Multilevel Personality in Context (MPIC) Model. *Psychological Inquiry*, *22*, 1-16.

Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What is satisfying about satisfying events? Testing 10 candidate psychological needs. *Journal of Personality and Social Psychology*, *80*, 325-339.

Sheldon, K. M., Elliot, A. J., Ryan, R. M., Chirkov, V., Kim, Y., Wu, C., & Sun, Z. (2004). Self-concordance and subjective well-being in four cultures. *Journal of Cross-Cultural Psychology*, *35*, 209-223.

Sheldon, K. M., & Niemiec, C. P. (2006). It's not just the amount that counts: Balanced need satisfaction also affects well-being. *Journal of Personality and Social Psychology*, *91*, 331-341.

Sheldon, K. M., Ryan, R. M., Rawsthorne, L. J., & Ilardi, B. (1997). Trait self and true self: Cross-role variation in the Big-Five personality traits and its relations with psychological authenticity and subjective well-being. *Journal of Personality and Social Psychology*, *73*, 1380-1393.

Sheldon, K. M., Ryan, R. M., & Reis, H. (1996). What makes for a good day? Competence and autonomy in the day, and in the person. *Personality and Social Psychology Bulletin*, *22*, 1270-1279.

Singelis, T. M. (1994). The measurement of independent and interdependent self-construals. *Personality and Social Psychology Bulletin*, *20*, 580-591.

Sobel, M. E. (1982). Asymptotic intervals for indirect effects in structural equations models. In S. Leinhart (Ed.), *Sociological methodology* (pp. 290-312). San Francisco: Jossey-Bass.

Spencer-Rodgers, J., Peng, K., Wang, L., & Hou, Y. (2004). Dialectical self-esteem and east-west differences in psychological well-being. *Personality and Social Psychology Bulletin*, *30*, 1416-1432.

Spencer-Rodgers, J., Srivastava, S., Boucher, H. C., English, T., Paletz, S. B., & Wang, L*., et al.* (2010). *The Dialectical Self Scale*. Unpublished manuscript, University of California, Santa Barbara.

Spencer-Rodgers, J., Williams, M. J., & Peng, K. (2010). Cultural differences in expectations of change and tolerance for contradiction: A decade of empirical research. *Personality and Social Psychology Review*, *14*, 296-312.

Steenkamp, J.- B. E.M., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research*, *25*, 78-90.

Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The Meaning of Life Questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology*, *53*, 80-93.

Steger, M. F., Kawabata, Y., Shimai, S., & Otake, K. (2008). The meaningful life in Japan and the United States: Levels and correlates of meaning in life. *Journal of Research in Personality*, *42*, 660-678.

Tay, L., & Diener, E. (2011). Needs and subjective well-being around the world. *Journal of Personality and Social Psychology*, *101*, 354-365.

Triandis, H. C. (1995). *Individualism and collectivism*. Boulder, CO: Westview Press.

Van Dierendonck, D. (2005). The construct validity of Ryff's Scales of Psychological Well-Being and its extension with spiritual well-being. *Personality and Individual Differences*, *36*, 629-643.

Van Dierendonck, D., Díaz, D., Rodríguez-Carvajal, R., Blanco, A., & Moreno-Jiménez, B. (2008). Ryff's six-factor model of psychological well-being, a Spanish translation. *Social Indicators Research*, *87*, 473-479.

Vansteenkiste, M., Lens, W., Soenens, B., & Luyckx, K. (2006). Autonomy and relatedness among Chinese sojourners and applicants: Conflictual or independent predictors of well-being and adjustment? *Motivation and Emotion*, *30*, 273-282.

Watson, D., & Clark, L. A. (1994). *The PANAS-X: Manual for the positive and negative affect schedule – expanded form*. Iowa City: University of Iowa.

Yamaguchi, S. (1994). Collectivism among the Japanese: A perspective from the self. In U. Kim, H. C. Triandis, C. Kagitcibasi, S. C. Choi, & G. Yoon (Eds.), *Individualism and collectivism: Theory, method, and applications* (pp. 175-188). Thousand Oaks, CA: Sage.