

What Is Satisfying About Satisfying Events? Testing 10 Candidate Psychological Needs

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Three studies compared 10 candidate psychological needs in an attempt to determine which are truly most fundamental for humans. Participants described “most satisfying events” within their lives and then rated the salience of each of the 10 candidate needs within these events. Supporting self-determination theory postulates (Ryan & Deci, 2000)—autonomy, competence, and relatedness, were consistently among the top 4 needs, in terms of both their salience and their association with event-related affect. Self-esteem was also important, whereas self-actualization or meaning, physical thriving, popularity or influence, and money–luxury were less important. This basic pattern emerged within three different time frames and within both U.S. and South Korean samples and also within a final study that asked, “What’s unsatisfying about unsatisfying events?” Implications for hierarchical theories of needs are discussed.

Psychologists have long speculated about the fundamental psychological needs of humans, beginning with McDougall (1908) and Freud (1920) and continuing on through Murray (1938) and Maslow (1954) to the present day (Baumeister & Leary, 1995; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Need concepts are attractive because they can potentially provide genotypic explanations for the wide variety of phenotypic behaviors that individuals express (Baumeister & Leary, 1995). By assuming that humans strive for certain fundamental qualities of experience, one is enabled to see unity (or equifinality) within broad diversities of behavior. Need concepts are also attractive because they readily suggest psychosocial interventions. That is, once identified, psychological needs can be targeted to enhance personal thriving, in the same way that the organic needs of plants, once identified, can be targeted to maximize thriving in the plant (Ryan & Deci, 2000). Finally, need constructs may offer a way to unify the field of motivational psychology, in the same way that the Big Five model has served to unify trait psychology. To settle on a basic set of human needs would serve to anchor a wide variety of motivational and functional analyses.

Unfortunately, the utility of the psychological need construct has been limited thus far. In part, this is due to the large number of

potential needs that have been posited and the corresponding lack of consensus regarding which are most central or primary. In this sense the psychological need construct stands in the same stead as the early instinct concept, which collapsed because of a similar multiplicity (Weiner, 1992). In addition, there has been little consensus on the exact definition of needs. Are they ineluctable motive forces, pushing out from the person, or are they required experiential inputs, coming into the person (McClelland, 1985)? Furthermore, there is little consensus on what criteria to use to identify needs. Do needs refer to almost any type of desire or craving, or perhaps only to certain special, health-inducing motives (Ryan, 1995)? Finally, it is unclear where psychological needs come from. Are they acquired individual differences, perhaps learned early in life and perhaps varying across cultures, or are they inherent and universal in their scope, perhaps enplaced into human nature by evolution (Tooby & Cosmides, 1992)?

The purpose of this article is to comparatively examine 10 different feelings, each of which has been proposed as a need by prominent psychological theories, in order to determine which candidate needs can best be supported by data. In so doing, we will assume and try to demonstrate that psychological needs are particular qualities of experience that all people require to thrive (Deci & Ryan, in press; Sheldon, Ryan, & Reis, 1996). Thus, our definition views needs primarily as necessary inputs rather than as driving motives, leaving open the possibility that particular motives may not satisfy organismic needs, even if they are attained (Sheldon & Kasser, 1998). As a primary criterion for evaluating the importance of candidate needs, we will measure the extent to which each need accompanies the “most satisfying events” that people describe as having occurred within varying periods of time.

As can be seen, our chosen methodology relies in part on an analysis of natural language: What do people mean when they say some experience was satisfying? By starting with self-identified

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satisfying events and then examining what psychological characteristics are most salient within them, we hope to gain an important new window on the fundamental needs question, in the same way that lexical or natural-language analyses have provided a new window on the fundamental-traits question (Saucier & Goldberg, 1995). It is also worth noting that our methodology is of a mixed idiographic–nomothetic type (Emmons, 1989). That is, we started with participants' unique experiential memories, giving the resulting data considerable personological meaning and validity. Despite this, we were also able to make numerical comparisons between participants and between needs, by focusing on the nomothetic ratings that participants made regarding the personal events they described. Such mixed methodologies have become increasingly useful and popular within contemporary personality psychology (Little, 1999).

Identifying Candidate Needs

To derive a set of candidate needs for the study, we drew from a variety of psychological theories. As a foundation we used Deci and Ryan's self-determination theory of motivation (1985, in press), which specifies that people want to feel effective in their activities (competence), to feel that their activities are self-chosen and self-endorsed (autonomy), and to feel a sense of closeness with some others (relatedness). Of course, competence is a well-known need, reflected in White's concept of mastery (1959), Bandura's concept of self-efficacy (1997), and Atkinson's concept of achievement motivation (1964). Similarly, the proposal that humans need to feel a sense of relationship with important others is also relatively uncontroversial (Baumeister & Leary, 1995; Reis & Patrick, 1996). Although autonomy is somewhat more controversial and easily misunderstood (Ryan & Deci, 2000; Sheldon et al., 1996), it is featured in many other theories besides Deci and Ryan's, including Murray's (1938), Erickson's (1963), and Roger's (1963) seminal theories of personality.

We also drew from Maslow's theory of personality (1954) and its set of five fundamental needs: physical health, security, self-esteem, love–belongingness, and self-actualization. In brief, Maslow proposed that people need to feel that the biological requirements of their physical organism are satisfied, a sense of order and predictability within their lives, a sense of personal worthiness and importance, a sense of love and affection with important others, and that they are moving toward an ideal world or version of themselves.

Notably, Maslow's conception of a love or belongingness need is essentially equivalent to Deci and Ryan's relatedness need in that both address feelings of interpersonal connection. Thus the two models are redundant on this score. However, we believe that there are important differences between Deci and Ryan's autonomy and competence needs and Maslow's self-actualization and self-esteem needs (Deci & Ryan, in press). *Autonomy* refers to a quality of self-involvement in momentary behavior, whereas *self-actualization* refers to a sense of long-term growth; *competence* refers to attaining or exceeding a standard in one's performance, whereas *self-esteem* refers to a more global evaluation of the self. Thus, we assessed these four needs separately. In sum, the two models together suggest seven different psychological needs that might be tested: autonomy, competence, relatedness, physical, security, self-esteem, and self-actualization.

In addition, we consulted Epstein's cognitive–experiential self-theory (1990), which specifies four needs or functions that all individuals must satisfy: self-esteem, relatedness, pleasure (vs. pain), and self-concept consistency. Of course, self-esteem and relatedness were already discussed above. Also, we view Epstein's self-consistency need as roughly equivalent to Maslow's need for security in that the primary function of self-consistency, according to Epstein, is to bring a sense of stability to the individual. Thus, Epstein's model supplies one new candidate need to our list, the need for pleasurable stimulation, bringing the total number of candidates to eight.

Finally, we drew from a prominent lay theory of human needs, namely the "American dream" assumption that happiness results when individuals acquire popularity–influence and money–luxuries (Derber, 1979). Indeed, the ability to "win friends and influence people" (Carnegie, 1936) has long been extolled as a route to a prosperous and thus happy life. Despite such common beliefs, recent work indicates that these two experiential commodities may not be so important after all, and they may in fact may be negatively related to well-being (Carver & Baird, 1998; Kasser & Ryan, 1993, 1996; King & Napa, 1998). Nevertheless, we included them in order to test these recent findings in a new way and to allow prominent cultural, as well as psychological, theories of needs to have their say.

Notably, the above set of 10 needs (autonomy, competence, relatedness, physical thriving, security, self-esteem, self-actualization, pleasure–stimulation, money–luxury, and popularity–influence) also represent many other prominent assumptions and theories within the literature. For example, mainstream social psychology often assumes two basic psychological needs or motives: self-enhancement and self-consistency (Swann, 1990). These are approximately represented in our set by *self-esteem* and *security*. The need for *pleasurable stimulation*, derived from Epstein's (1990) model, encapsulates the single most basic motive according to hedonistic philosophies. Baumeister and Leary (1995) have argued for a different singularly important need, belongingness, which is represented in our set as *relatedness*. Terror management theory also posits a single superordinate need, for *self-esteem* (Greenberg, Pyszczynski, & Solomon, 1995), as does classic humanistic psychology, for *self-actualization* (Rogers, 1963); both of these are included in our set of 10. Evolutionary or adaptationist perspectives on personality often postulate inborn motives to attain material and social dominance (Buss, 1997; Hogan, 1996), which are represented herein as *money–luxury* and *popularity–influence*. Finally, in our choice of items for Maslow's growth or self-actualization need, we attempted to give some representation to the fundamental need for meaning that has been proposed by so many theorists (Baumeister, 1991; Frankl, 1997). In sum, although we do not claim to have captured all potential psychological needs with these 10 candidates, we believe the chosen set has considerable range and represents a variety of important theories.

Evaluating the Relative Importance of Candidate Needs

We used two basic criteria in trying to determine the most fundamental needs. First, which candidate qualities of experience are rated as most present or salient within peoples' "most satisfying experiences?" Presumably, those qualities of experience that are in truth most satisfying (and perhaps actually needed by humans) will be most strongly represented within participants'

ratings of the naturally occurring peak experiences they identify. As discussed above, this assumption relies on a natural-language criterion: Needs will be defined as the qualities of experience most closely associated with participant-designated satisfying events. In contrast, candidate needs that are not salient within satisfying events might with some justification be eliminated from further consideration.

As a second criterion for identifying needs, we asked, "Which qualities of experience best predict variations in positive and negative affect associated with the event described?" Here, we rely on the assumption of Deci and Ryan (in press), Baumeister and Leary (1995), and others—that satisfied needs should promote well-being and psychological thriving in the same way that proper fertilization promotes the growth of plants. A second and related reason to use affect and mood variables as criteria is that they offer a relatively value- and context-free window on psychophysical thriving (Ryff & Singer, 1998). Presumably, all humans have the same basic emotional systems, and arguably any person feeling much positive mood and little negative mood is thriving.

Reis et al. (2000), Sheldon and Bettencourt (2000), Sheldon and Elliot (1999), and Sheldon et al. (1996) all used such affect-based indicators of thriving in their more limited studies of psychological needs. However, the current study moves considerably beyond these past studies, not only by sampling satisfying experiences directly but also by examining a large set of needs derived from a wide assortment of theories, not just the three needs derived from Deci and Ryan's theory.

Notably, this second (affect-based) criterion supplies a more indirect test of the importance of candidate needs, one that does not rely on participants' explicit beliefs about the meaning of *satisfying*. In theory, the two criteria could yield different results (i.e., the experiential qualities that participants rate as strongest or most salient within satisfying events may not be the same qualities that are most associated with the presence of positive affect and the absence of negative affect during those events). To find convergences such that the same candidate needs emerge as most important by both criteria would nicely support those candidacies and would also support our general approach to identifying needs.

Overview of Studies and Hypotheses

Study 1 had three goals. First, we tested our item set for measuring the 10 candidate needs. Second, we compared the relative salience of the 10 qualities of experience within the "most satisfying event of the past month" described by participants and compared the 10 needs as predictors of event-related positive and negative affect. Third, we examined a trait measure of the strength of each of the 10 needs, to see whether individual differences in need strengths moderate the effect of the corresponding need variables on positive and negative affect. This latter hypothesis is suggested by "matching" theories of satisfaction, in which experiences are most rewarding when they match the preferences of the experiencer (Harackiewicz & Sansone, 1991; Oishi, Diener, Suh, & Lucas, 1999). Finding no support for a matching hypothesis would tend to support a universalist perspective, which assumes that "true" needs are those that influence every person's well-being, regardless of the person's stated preferences (Deci & Ryan, in press).

In Study 2 we asked a U.S. sample and a South Korean sample to describe "the most satisfying event of the last week." The inclusion of the U.S. sample enabled us to examine the replicability of the Study 1 results, and the instructions to think of the "last week" enabled examination of the replicability of results to a shorter time frame. More important, this design allowed us to examine the generalizability of effects to a collectivist culture. Because recent cross-cultural work suggests that psychological motives might differ substantially in collectivistic cultures (Markus, Kitayama, & Heiman, 1996), it was important to include such a sample to explore the potential "universality" of identified needs. Finally, in Study 3 we examined the replicability of Study 1 and Study 2 results to a longer time frame (the whole semester) and also examined the replicability of results when participants reported on their most unsatisfying events, as well as their most satisfying events.

On the basis of our own past findings (Reis et al., 2000, Sheldon & Elliot, 1999, Sheldon et al., 1996) and self-determination theory (Deci & Ryan, 1985), we expected that autonomy, competence, and relatedness would all emerge as important needs (Deci & Ryan, in press). That is, they should have among the highest mean scores in peoples' ratings of satisfying events, and they should all be significantly and uniquely associated with event-related affect. On the basis of Deci and Ryan's further claim that these three needs are universal and important within every sphere of life, we expected to find these patterns within every time frame examined, and also within every culture examined. Notably, our view predicts only that this *set* of needs should emerge at or near the top, and it does not make predictions about the ordering of needs within that set; thus, the relative importance of autonomy, competence, and relatedness may well vary among contexts, time frames, and cultures. Finally, on the basis of Kasser and Ryan's prior (1993, 1996) findings, we also expected that popularity–influence and money–luxury would be least important. No other a priori predictions were ventured.

Study 1

Method

Participants and Procedure

Participants were 322 students in introductory psychology at the University of Missouri who participated in the research to satisfy an experimental participation requirement (7 participants were later excluded from the analysis because they did not follow instructions). Participants attended group sessions run by a trained research assistant in which they completed a single questionnaire packet containing all study materials.

Measures

Most satisfying event. At the beginning of the questionnaire, participants read the following:

Now, we ask you to consider the past month of your life. Think back to the important occurrences of this period of time. What we want you to do is bring to mind the *single most personally satisfying event* that you experienced during the last month (emphasis in the original). We are being vague about the definition of "satisfying event" on purpose,

Table 1
 Study 1: Need-Satisfaction Items With Factor Loadings Greater Than .45

Item (responses to "During this event I felt . . .")	Factor								
	1	2	3	4	5	6	7	8	9
1. Autonomy									
That my choices were based on my true interests and values.	.66								
Free to do things my own way.	.64								
That my choices expressed my "true self."	.72								
2. Competence									
That I was successfully completing difficult tasks and projects.		.86							
That I was taking on and mastering hard challenges.		.82							
Very capable in what I did.		.49							
3. Relatedness									
A sense of contact with people who care for me, and whom I care for.			.80						
Close and connected with other people who are important to me.			.85						
A strong sense of intimacy with the people I spent time with.			.77						
4. Self-actualization—meaning									
That I was "becoming who I really am."				.78					
A sense of deeper purpose in life.				.76					
A deeper understanding of myself and my place in the universe.				.81					
5. Physical thriving									
That I got enough exercise and was in excellent physical condition.					.69				
That my body was getting just what it needed.					.73				
A strong sense of physical well-being.					.66				
6. Pleasure—stimulation									
That I was experiencing new sensations and activities.					.57				
Intense physical pleasure and enjoyment.					.78				
That I had found new sources and types of stimulation for myself.					.61				
7. Money—luxury									
Able to buy most of the things I want.						.77			
That I had nice things and possessions.						.69			
That I got plenty of money.						.81			
8. Security									
That my life was structured and predictable.							.69		
Glad that I have a comfortable set of routines and habits.							.70		
Safe from threats and uncertainties.							.48		
9. Self-esteem									
That I had many positive qualities.								.78	
Quite satisfied with who I am.								.77	
A strong sense of self-respect.								.80	
10. Popularity—influence									
That I was a person whose advice others seek out and follow.									.58
That I strongly influenced others' beliefs and behavior.									.79
That I had strong impact on what other people did.									.82

because we want you to use your own definition. Think of "satisfying" in whatever way makes sense to you. Take a couple minutes to be sure to come up with a very impactful experience.

The event descriptions that were provided by participants in response to these instructions were quite diverse, ranging from achievement to familial, to sexual, to spiritual, and to many other domains.¹

Participants were next asked to make ratings about the event, concerning "a variety of complex thoughts and feelings." Hoping to encourage participants to differentiate carefully between different types of positive feelings, we asked them to "be as discriminating as you can in making these ratings." Participants then responded to 30 descriptive statements, 3 for each of the 10 postulated needs, using a 1 (*not at all*) to 5 (*very much*) scale. All descriptions began with the same stem: "During this event I felt . . ." Salience scores were computed for each of the 10 candidate needs by averaging the 3 relevant items. The specific item-set, which was derived from theoretical analysis and pilot work, is presented in Table 1.

Participants also rated the extent to which they felt each of 20 different moods during the event, using the same scale. Specifically, they completed the Positive Affect/Negative Affect scale (PANAS) regarding the event (Watson, Tellegen, & Clark, 1988). The PANAS contains mood adjectives

such as *scared*, *hostile*, *inspired*, and *proud*. Positive and negative affect scores were computed by averaging the appropriate ratings and were treated as outcome variables. In addition, an affect-balance score was computed by subtracting the negative affect score from the positive affect score (Bradburn, 1969). This score served as a third, summary outcome variable.

Assessing individual differences in need preferences. In an attempt to assess individual differences in the strengths of the 10 needs, we used the pairwise comparison technique of Oishi, Schimmack, Diener, and Suh (1998). In their research, definitions of each of 10 values were presented to participants, who then indicated their preferences within every possible pairing of values. The advantage of this comparison method is that the influence of response sets is minimized, because the method focuses on the relative strength of responses compared with

¹ Although we attempted to develop content-coding schemes for categorizing the events into specific types, the task proved too difficult given that many events touched on multiple possible content categories or were ambiguous with respect to potential coding categories.

other responses made by the subject, excluding mean levels of responding. In the current work, we supplied participants with definitions of each of our 10 candidate needs (these definitions can be found in the Appendix *a*) and then asked them to rate their relative preference within each possible pairing, using a scale of -2 (*first is much more important*) to 0 (*each is equally important*) to $+2$ (*second is much more important*). Participants made 45 ratings altogether, and we computed 10 different need-strength variables by summing the level of preference expressed for each candidate need as compared with the other 9 candidates (see Oishi et al., 1998, for further scoring details). The measure was given prior to the "most satisfying event" measures.

Results

Factor Analysis

We first conducted a principal-components analysis of the 30 event-related need-satisfaction variables, using a varimax rotation. Table 1 presents the resulting solution, including all factor loadings of .45 or greater.² Only 9 factors with eigenvalues of 1.0 or greater emerged, rather than the expected 10. Inspection of the loadings revealed that the three pleasure–stimulation items and the three physical thriving items all loaded on the same factor (see Table 1). Despite their intercorrelation, we computed a separate score for these two candidate needs on the basis of our a priori theoretical model.³

Substantive Analyses

Mean differences in the salience of candidate needs. Table 2 presents the means for each of the 10 needs, in rank order. Differences between these means were tested using paired-sample *t* tests. Given the number of tests performed, a significance level of .01 was adopted for these analyses. As can be seen, self-esteem, relatedness, and autonomy emerged in a three-way tie at the top of the list, suggesting that these are the most salient experiential elements of "satisfying experiences." Competence was close behind, in second position, and thus our hypothesis based on self-determination theory—that autonomy, competence, and relatedness would be among the most important experiential characteristics—received good support. Pleasure–stimulation was in the third position, consistent with Epstein's (1990) assumptions and with hedonic philosophy

Table 2
Study 1: Mean Salience of Each Candidate Need Within Participants' Most Satisfying Experiences of the Last Month

Candidate need	<i>M</i>	<i>SD</i>
Self-esteem	4.08 _a	0.90
Relatedness	3.99 _a	1.13
Autonomy	3.98 _a	0.87
Competence	3.74 _b	0.98
Pleasure–stimulation	3.53 _c	1.08
Physical thriving	3.25 _d	1.13
Self-actualization–meaning	3.23 _d	1.13
Security	3.03 _e	0.90
Popularity–influence	2.89 _e	1.02
Money–luxury	2.37 _f	1.08

Note. Means not sharing subscripts are significantly different from each other at $p \leq .01$. Means could range from 1.00 to 5.00.

Table 3
Study 1: Correlations of Candidate Needs With Event-Related Affect

Candidate need	Positive affect	Negative affect	Affect balance
Self-esteem	.43**	-.27**	.43**
Autonomy	.31**	-.24**	.34**
Competence	.39**	-.05	.26**
Relatedness	.21**	-.16**	.23**
Pleasure–stimulation	.32**	-.02	.20**
Physical thriving	.34**	-.02	.20**
Self-actualization–meaning	.24**	.00	.13*
Security	.21**	-.01	.12*
Popularity–influence	.14**	.13*	-.01
Money–luxury	.05	.21**	-.12*

* $p < .05$. ** $p < .01$.

more generally. Physical thriving and self-actualization–meaning emerged in the fourth position, accounting for the third and fourth of Maslow's five posited needs. The significant mean difference between physical thriving and pleasure–stimulation is noteworthy because, as presented above, the items from these two needs all loaded on the same factor; here, however, the two needs are distinguishable. Security was in the next position, accounting for the final needs in both Maslow's (fivefold) and Epstein's (fourfold) postulated sets. Popularity–influence and money–luxury brought up the rear, supporting our hypothesis, based on self-determination theory, that these two aspects of the "American dream" may not be so desirable after all (Kasser & Ryan, 1993, 1996).

Associations of need satisfaction with event-related affect. Table 3 presents the correlations of each of the 10 satisfaction scores with event-related positive affect and negative affect, and also with the composite affect-balance score. As can be seen, the very same needs that emerged as most important by the first criterion also emerged as paramount by this second criterion. Specifically, the four most strongly endorsed needs—self-esteem, autonomy, competence, and relatedness—were also found to be most strongly associated with high-positive and low-negative emotion. Furthermore, pleasure–stimulation, physical health, self-actualization–meaning, and security–control—the middle four needs in Table 1—were less strongly associated with high-positive and low-negative affect. Finally, popularity–influence and money–luxury—the two most weakly endorsed experiences in Table 1—were also unrelated or even negatively related to affect balance, consistent with our hypotheses and the "dark side of the American dream" effects described by Kasser and Ryan (1993, 1996).

² We have not presented cross-loadings in this table, in order to simplify the presentation. For the record, one item cross-loaded more than .40 on an unintended scale (i.e., "I felt very capable in what I did," a competence item, cross-loaded .44 on self-esteem). Ten items cross-loaded more than .30 on unintended scales, and the remaining cross-loadings were all less than .30.

³ Notably, our approach does not require that all candidate needs suggested by existing theories emerge as empirically distinct; obviously, different theories may sometimes converge on the same basic need from different conceptual angles.

Regression comparisons. To test our specific hypotheses concerning the importance of autonomy, competence, and relatedness, we conducted a series of simultaneous regressions. In these analyses, each of the event-related affect variables was regressed in turn on these three candidate needs. All three of the needs postulated by self-determination theory significantly predicted positive affect (autonomy, $\beta = .16$; competence, $\beta = .37$; relatedness, $\beta = .17$; all p s $< .01$). Only autonomy predicted negative affect ($\beta = -.21$, $p < .01$). Thus, as in past work, need satisfaction appears to be more important for producing positive affect than for reducing negative affect (Sheldon & Bettencourt, 2000; Sheldon et al., 1996). Most important, as hypothesized, all three needs postulated by self-determination theory predicted the aggregate affect-balance variable (autonomy, $\beta = .23$, $p < .01$; competence, $\beta = .21$, $p < .01$; relatedness, $\beta = .14$, $p < .05$).

Next, we conducted an analysis in which all 10 candidate needs were entered simultaneously as predictors of the affect-balance variable. This most stringent test removes all common variance shared by the 10 candidates in order to see which, if any, contribute unique variance in the prediction of positive affective tone. In this analysis, Autonomy, Competence, and Relatedness all emerged as significant (β s = .17, .12, and .12, respectively, p s $< .05$). In addition, Self-Esteem contributed unique predictive variance ($\beta = .28$, $p < .01$). It is interesting that money-luxury emerged as a negative predictor in this analysis ($\beta = -.17$, $p < .01$), again supporting the "dark side" hypothesis. No other need candidates were significant in this analysis.

Individual differences in need preference as a moderator variable. Finally, we looked at the moderating influence of each of the individual-difference measures of need strength on the event-related need salience to event-related affect relations. As discussed above, a "matching" hypothesis would predict that those individuals who report that they strongly prefer a particular experience should benefit the most, in terms of resultant affective tone, from experiences of that type. To test this, we computed 10 product terms by multiplying each of the centered need-preference variables by the corresponding event-related satisfaction score (Aiken & West, 1991). We then conducted a regression analysis using the affect-balance score as the dependent measure. As above, all 10 satisfaction scores were entered at the first step, then the 10 need-preference scores were entered at the second step, and finally the 10 product terms were entered at the third step.

None of the need-preference variables was significant at the second step. At the third step, only one significant interaction effect emerged, for self-actualization-meaning ($p < .02$). The coefficient was positive, indicating that feelings of growth and meaningfulness are more strongly associated with positive event-related affect when the person especially values such feelings. However, the set of 10 product terms as a whole did not add significant predictive variance to the equation ($\Delta R^2 = .03$, $p = .21$). Thus, these results do not provide much support for the matching hypothesis.

Discussion

The results from Study 1 provide encouraging support for our method of approaching questions concerning fundamental psychological needs. With the exception of the pleasure-stimulation and physical thriving needs, participants were able to discriminate

clearly among the items representing the 10 candidate needs. More important, strong convergence was observed between our two distinct criteria for identifying needs. That is, the same candidate needs that were rated as strongly present in satisfying experiences were also strongly positively correlated with pleasure in that experience. This convergence suggests that participants really do know "what's satisfying about satisfying events."

Study 1 also provided encouraging support for our hypotheses based on self-determination theory, concerning which needs are most fundamental. First, the trio of autonomy, competence, and relatedness emerged within the top four in terms of salience. In other words, it appears that when people are asked to bring to mind deeply satisfying experiences, they think of experiences in which they felt strongly autonomous, competent, or related to others. Second, each of the three needs postulated by self-determination theory predicted independent variance in event-related affect, and all three continued to do so even when the other seven needs were in the equation. Our final hypothesis based on self-determination theory also received support in Study 1, that popularity-influence and money-luxury are least important and may even be negative for well-being (Kasser & Ryan, 1993, 1996). Of interest is that self-esteem also emerged as an important need by our criteria, consistent with some contemporary theories of needs (i.e., Greenberg et al., 1995). This finding was not predicted by self-determination theory.

Study 1 had two important limitations. First, it addressed only satisfaction within a single time frame (i.e., "events within the last month"). In fact, time frame can have an important influence on mood and affective reports (Suh, Diener, & Fujita, 1996), as different types of memory processes may be involved in immediate versus more long-term recall (Thomas & Diener, 1990). Thus, to better establish the strength and differential influence of identified needs, it was necessary to replicate the effects using a different time frame. A second weakness of Study 1 is that participants came from a single (highly individualistic) culture, the United States. To begin to establish cross-cultural replicability for the identified needs, it was necessary to reproduce the effects within a more collectivist culture. In Study 2 we addressed both of these issues.

Study 2

Method

Participants and Procedure

Two samples were used for Study 2. The U.S. sample consisted of 152 students in introductory psychology at the University of Missouri who participated in the research to satisfy an experimental participation requirement. The South Korean sample consisted of 200 students in introductory psychology at Hanyang University in South Korea, who also participated to satisfy an experimental requirement. Both universities are large, with more than 15,000 students. Participants attended group sessions run by trained research assistants in which they completed a questionnaire packet containing all experimental materials.

Translation

The English questionnaire was translated into Korean by Youngmee Kim, a native Korean. A back-translation was then accomplished by a second Korean speaker. Working from the back-translation, Kennon M.

Sheldon and Youngmee Kim collaborated to create a final South Korean version of the questionnaire.

Measures

Instructions for identifying a "most satisfying event" were identical to those in Study 1, with one exception: All participants were asked to consider the past week, rather than the past month, of their lives. The resulting event descriptions again showed a great deal of diversity.

Participants next responded to the same 30 descriptive statements used in Study 1, using the same stem: "During this event I felt . . ." Salience scores were computed for each of the 10 candidate needs by averaging the 3 relevant items. Participants also rated the extent to which they felt the 20 PANAS moods during the event, using a scale of 1 (*not at all*) to 5 (*very much*). Positive and negative affect scores were computed by averaging the appropriate ratings, and an affect-balance variable was computed by subtracting the negative from the positive affect score.

Participants in Study 2 also indicated their family income status on a scale ranging from 1 = *much below* to 5 = *much above* their country's median income. (Of course, the monetary amounts associated with scale points differed in the two cultures.) Family income was used as a control variable in regression analyses in an attempt to partial out any effects of socioeconomic status.

Results

Mean Differences in the Salience of Candidate Needs

Table 4 presents means and standard deviations for each candidate need separately for each sample. Of interest is that salience scores in general were lower in these two samples than in Study 1, probably because the events referred only to the past week and not the past month. In terms of salience ratings for the candidate needs, results for the U.S. sample were quite similar to those found in Study 1. Specifically, autonomy, competence, and relatedness again emerged within the top four needs, along with self-esteem. As in Study 1, all four of these candidate needs were more strongly endorsed than those in a middle group, which included pleasure-

stimulation, self-actualization-meaning, and physical thriving. Notably, popularity-influence also fell in this middle group, rather than being in the lowest group, as in Study 1. Once again, however, money-luxury appeared at the very bottom of the list.

In the South Korean sample, as in the two U.S. samples, autonomy, competence, and relatedness were all among the top needs. Thus, our primary hypotheses again received good support. In addition, self-esteem emerged near the top, as did pleasure-stimulation. Notably, however, the exact ordering of these needs was somewhat different within the South Korean sample. As can be seen, relatedness topped the list, perhaps consistent with the collectivism that characterizes South Korean culture (Markus et al., 1996). Self-esteem occupied the second position, seemingly at odds with recent findings that self-esteem and self-enhancement are not as important within Asian cultures (Heine & Lehman, 1997; Kitayama, Markus, & Lieberman, 1995). Autonomy, competence, and pleasure-stimulation occupied the third position. Self-actualization-meaning, security, and popularity-influence occupied the fourth position, forming a middle group very similar to those found in the U.S. samples. Physical thriving occupied the fifth position, and as in the U.S. samples, money-luxury was last on the list.

Table 4 also contains the results of 10 matched group *t* tests that compared the U.S. and South Korean means. As can be seen, despite the large sample sizes and potential translation difficulties, the two samples did not differ on the extent to which 5 of the 10 candidate experiences accompanied "satisfying events," namely autonomy, competence, physical thriving, self-actualization-meaning, and popularity-influence. However, South Koreans did report a greater sense of relatedness and also of security, pleasure or stimulation, and money or luxuries in their satisfying events, compared with the U.S. sample. In addition, South Koreans reported a relatively weaker sense of self-esteem during the event, compared with the U.S. sample. Thus, in relation to U.S. participants at least, recent findings regarding the weaker salience of self-esteem in Asian cultures were confirmed (Kitayama et al., 1995).

Table 4
Study 2: Mean Salience of Each Candidate Need Within Participants' Most Satisfying Experiences of the Last Week, by Sample

Candidate need	U.S. sample		South Korean sample		<i>t</i> (350)
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Self-esteem	3.65 _a	1.06	3.23 _b	0.91	4.01**
Relatedness	3.21 _b	1.42	3.65 _a	1.07	3.31**
Autonomy	3.12 _b	1.18	3.01 _c	0.95	1.03
Competence	2.98 _b	1.14	2.91 _c	1.09	0.61
Pleasure-stimulation	2.60 _c	1.08	2.95 _c	0.90	3.05**
Physical thriving	2.49 _c	1.16	2.42 _e	1.04	0.54
Self-actualization-meaning	2.54 _c	1.13	2.69 _d	1.02	1.30
Security	2.46 _c	1.02	2.70 _d	0.88	2.37*
Popularity-influence	2.50 _c	1.02	2.71 _d	0.96	1.93
Money-luxury	2.14 _d	1.05	2.35 _e	0.91	2.02*

Note. Means within columns not sharing subscripts are significantly different from each other at $p \leq .01$. The fifth column tests the differences between the means of the two samples.

* $p < .05$. ** $p < .01$.

Associations of Need Satisfaction With Event-Related Affect

Table 5 contains the correlations of each of the candidate needs with event-related positive affect, negative affect, and affect balance, separately by sample. Results for the U.S. sample were very consistent with the results of Study 1 in that autonomy, competence, relatedness, and self-esteem were most strongly associated with positive affect and affect balance. Furthermore, autonomy and relatedness were again negatively associated with negative affect. Pleasure-stimulation, physical thriving, self-actualization-meaning, popularity-influence, and security were also (more weakly) associated with positive affective tone. Diverging from Study 1, in this sample the negative association between money-luxury and affect balance did not reach significance.

The associations of the need-satisfaction variables with positive affect were in general stronger within the South Korean sample; in fact, every correlation was significant, for both positive affect and for the aggregate affect-balance variable. Two findings regarding negative affect are noteworthy: Experiences of competence and

Table 5
 Study 2: Correlations of Candidate Needs With Event-Related Affect, by Sample

Candidate need	U.S. sample			South Korean sample		
	Positive affect	Negative affect	Affect balance	Positive affect	Negative affect	Affect balance
Self-esteem	.36**	-.11	.29**	.57**	-.14 [†]	.51**
Autonomy	.49**	-.21**	.43**	.51**	-.13**	.46**
Competence	.39**	-.03	.32**	.59**	.16**	.31**
Relatedness	.24**	-.22**	.29**	.29**	-.22*	.37**
Pleasure-stimulation	.27**	.00	.16*	.48**	-.03	.36**
Physical thriving	.16	.02	.08	.38**	-.10	.35**
Self-actualization-meaning	.23**	.02	.13	.47**	.12 [†]	.25**
Security	.32**	-.14	.28**	.42**	-.23**	.48**
Popularity-influence	.24**	.01	.14 [†]	.36**	-.05	.30**
Money-luxury	.00	.11	-.07	.24**	.00	.17*

* $p < .05$. ** $p < .01$. [†] $p < .10$ (marginally significant).

experiences of self-actualization-meaning were both positively predictive of negative affect.

To test our specific hypotheses concerning the importance of autonomy, competence, and relatedness, the three event-related affect variables were simultaneously regressed on these three candidate needs, separately for each sample. In the U.S. sample, all three quantities accounted for significant variance in positive affect (competence, $\beta = .44$; autonomy, $\beta = .30$; relatedness, $\beta = .15$; all $ps \leq .05$). This was also the case in the South Korean sample (competence, $\beta = .46$; autonomy, $\beta = .25$; relatedness, $\beta = .17$; all $ps < .05$). No significant effects were observed on negative affect in the U.S. sample, whereas in the South Korean sample competence was positively associated with negative affect ($\beta = .26$, $p < .01$), whereas autonomy and relatedness were negatively associated with negative affect ($\beta = -.19$ and $-.20$, both $ps < .01$). Finally, in the U.S. sample, autonomy, competence, and relatedness independently predicted the aggregate affective-balance variable ($\beta_s = .26$, $.28$, $ps < .01$, and $\beta = .19$, $p < .05$, respectively). Similarly, in the South Korean sample, all three experiences postulated as needs by self-determination theory predicted affect balance ($\beta_s = .33$, $.14$, and $.27$, respectively; $ps < .01$, $.05$, and $.01$, respectively).

Next, we conducted analyses in which all 10 candidate needs were entered simultaneously as predictors of the aggregate affect-balance variable, separately for each sample. Again, this most stringent test removes all variance shared by the 10 candidates to see which, if any, contribute unique variance in the prediction of affective tone. In the U.S. sample, autonomy, competence, and relatedness all emerged as significant ($\beta_s = .29$, $.25$, and $.21$; all $ps < .05$), and no other candidate needs contributed significant predictive variance. In the South Korean sample, autonomy and relatedness emerged as significant ($\beta_s = .26$ and $.20$, respectively; both $ps < .01$), whereas competence evidenced a nonsignificant trend ($\beta = .10$, $p = .18$). In addition, self-esteem ($\beta = .23$, $p < .01$) and security ($\beta = .25$, $p < .01$) contributed significant positive variance within the latter equation, and money-luxury ($\beta = -.22$, $p < .01$) was a negative predictor.

We then tested for significant interactions between culture and the 10 candidate needs, in relation to the affect-balance variable. Specifically, we conducted a hierarchical regression using the

entire sample of 352 participants, in which all 10 (centered) need candidates were entered at Step 1, followed by a dummy variable at Step 2 indicating to which sample the participant belonged (U.S. or South Korean), followed by a set of 10 product terms at Step 3, which represented the interaction of culture with each of the 10 need candidates. At Step 1, autonomy, competence, and relatedness were all significant ($\beta_s = .27$, $.17$, and $.15$, respectively; all $ps < .01$). In addition, self-esteem and security manifested positive effects ($\beta_s = .18$ and $.15$, both $ps < .01$), and money-luxury had a negative effect ($\beta = -.15$, $p < .01$). At Step 2 the dummy variable representing the subsample was significant ($\beta = -.14$, $p < .05$), indicating that the South Koreans were somewhat lower on event-related affect balance ($M = 1.63$ vs. $M = 1.32$; although South Koreans were no different in event-related negative affect, they were much lower in positive affect). At Step 3, none of the 10 interaction product terms were significant; furthermore, the set as a whole did not contribute significant variance to the equation ($\Delta R^2 = .02$, $p = .34$), suggesting that the influence of these 10 qualities of experience on affect balance did not vary as a function of participants' cultural membership.

A final set of analyses examined the family-income variable. Americans and South Koreans did not differ on this variable ($M = 2.95$ vs. $M = 2.89$, respectively, ns). For the whole sample, family income was associated with only 1 of the 10 need-salience variables, namely money-luxury ($r = .20$, $p < .01$). Of interest is that this association was far stronger in the South Korean sample ($r = .33$, $p < .01$) than in the U.S. sample ($r = .07$, ns), indicating that wealthier South Korean students perceive money or luxury to be quite salient in very satisfying events, whereas wealthier American students do not. Entering family income as a control variable did not substantially alter any of the regression results above, however.

Discussion

The results for the U.S. sample in Study 2 replicated the results for Study 1, but for a shorter time frame (i.e., most satisfying event of the last week instead of the last month). In terms of our first criterion for identifying needs, based on mean levels of endorsement, autonomy, competence, and relatedness again emerged at

the top of the list, as did self-esteem. Money–luxury was again at the bottom of the list, and the other candidates again fell in the middle. This same general ordering of needs was again found using our second criterion for identifying needs, namely association with event-related affect. Specifically, autonomy, competence, relatedness, and self-esteem were all unique predictors of positive affective tone, whereas money–luxury was again associated with negative affect.

Perhaps the most important finding of Study 2 was the emergence of similar results within the South Korean sample. Just as in the two U.S. samples, autonomy, competence, relatedness, and self-esteem emerged as the most important set, both in terms of mean differences and association with event-related affect. The findings regarding autonomy are especially noteworthy given recent challenges to self-determination theory's assumption that autonomy or perceived choice is a universal need (Iyengar & Lepper, 1999; Markus et al., 1996). It appears, here, that autonomy is equally important in the U.S. and South Korea, at least for characterizing what people consider satisfying and for predicting positive affect-balance.

Despite the strong convergences across the U.S. and South Korean samples, there were some meaningful differences. Feelings of relatedness were especially salient within South Koreans' "most satisfying experiences," consistent with South Korea's status as a collectivist culture and with the findings of Kwan, Bond, and Singelis regarding feelings of harmony (1997). Furthermore, feelings of self-esteem were less salient in Korea compared with the U.S., consistent with other recent work on the reduced importance of self-esteem in collectivist cultures (Kitayama et al., 1995). Notably, however, self-esteem still came in second within the South Korean hierarchy, suggesting that it does have importance. In sum, then, although the same set of needs emerged at the top in both samples, the ordering of needs within this set varied considerably. This suggests that the universalist and the cultural constructivist positions may both be correct. That is, it may be that certain needs are universal to humans in general, but the relative salience that people place on them depends on the extent to which their cultures encourage and support those needs.

Study 3

We next conducted a third study to extend the research presented thus far. First, we examined the "most satisfying event of the semester" to ensure generalizability of the effects to an even longer time frame. In fact, it is not difficult to think of reasons why different patterns might emerge when participants reflect back on long versus short periods of time. For example, self-actualization–meaning might be expected to be most salient within a more global frame of reference, whereas pleasure–stimulation might be most salient when a person considers short-term satisfactions. Thus, to clearly replicate Study 1 and 2 results in this much longer time period would help establish that the determinants of satisfaction do not vary according to the temporal scale of the event the person describes.

A second extension of Study 3 was to approach the question of fundamental needs from the opposite direction, namely by asking participants to describe the most unsatisfying event they experienced during the semester and then rate what was missing from the experience. We did this because psychological needs can be con-

sidered from a deficit perspective (i.e., as qualities that, if lacking, may lead to ill-being) as well as from an enhancement perspective (i.e., as qualities that, if present, may lead to well-being; Maslow, 1954). Conceptually, the absence of a positive quality may be quite different from, and have different effects than, the presence of a negative quality (Higgins, 1999). Also, peoples' construals of the word *satisfaction* might differ substantially when they consider dissatisfaction rather than satisfaction. Thus, to find that the same candidate needs emerge as important within both approaches would lend additional support for those candidacies.

Method

Participants and Procedure

Participants were 233 students in a psychology course at the University of Missouri who participated in the research for extra credit points. The measures were contained within a single questionnaire packet, which was administered in a group session near the end of the semester. Participants first identified a "most satisfying event" and then rated it in terms of both affect and candidate needs, then they identified and rated a "most unsatisfying event."

Measures

Most satisfying event. Instructions for identifying a "most satisfying event" were identical to those in Studies 1 and 2, with one exception: All participants were asked to "consider the entire semester" as they identified a particularly salient event.

Participants rated the event in terms of the same 30 descriptive statements used in Studies 1 and 2, using the same stem: "During this event I felt . . ." Need-satisfaction scores were computed for each of the 10 candidate needs by averaging the three relevant items. Participants also rated the extent to which they felt the 20 PANAS moods during the event, using a scale of 1 (*not at all*) to 5 (*very much*). Positive and negative affect scores were computed by averaging the appropriate ratings, and an affect-balance variable was computed by subtracting the score for negative affect from the score for positive affect.

To illustrate what types of events were designated as the "most satisfying of the semester," we identified the events with the highest associated affect-balance scores. Two events within the sample emerged by this criterion, namely "Going on a retreat with my friends at church. We did a service event and cleaned up a summer camp," and "When I got the summer job of my dreams." (both events reported verbatim).

Most unsatisfying event. Participants were next asked the following:

bring to mind the single most *unsatisfying* event that you experienced in the entire semester. That is, what is the least rewarding thing that happened to you during winter semester, 2000? Please think of unsatisfying in whatever way makes sense to you.

After writing their description, participants were asked "What was missing from this event, that is, why was it unsatisfying?" The same 30 descriptive statements were used that were used in Studies 1 and 2, with the wording altered so that they became negatives. For example, "During the event I felt that my choices were based on my true interests and values" became "During the event I felt that my choices were not based on my true interests and values." The stem "this event was unsatisfying because . . ." prefaced all items, and a scale of 1 (*not at all the reason*) to 5 (*very much the reason*) was given. Need-deficiency scores were later computed for each of the 10 candidate needs by averaging the three relevant items. Participants also rated the extent to which they felt the 20 PANAS moods during the event, using a scale of 1 (*not at all*) to 5 (*very much*). Positive and negative affect scores were computed by averaging the appropriate ratings, and an affect-

balance variable was computed by subtracting the score for the negative affect from the score for positive affect.

To illustrate what types of events were designated as the "least satisfying of the semester," we identified the events with the lowest associated affect-balance scores. Two events emerged by this criterion, namely "Broke up with a girlfriend of 2 years, 8 months," and "Getting jumped by 10 Mexicans while on spring break in Cancun."

Results

Most Satisfying Event of the Semester

Mean differences in the salience of candidate needs. Table 6 presents the mean salience of the 10 candidate needs within participants' "most satisfying event of the semester." These data essentially replicate the earlier results, for this longer time frame. As in Study 2, self-esteem was the most salient characteristic, and autonomy, competence, and relatedness were again in a three-way tie in the second position. Pleasure-stimulation and self-actualization-meaning occupied the third position. Security, popularity-influence, and physical thriving occupied the fourth position, and once again, money-luxury was last on the list.

Associations of need satisfaction with event-related affect. Table 7 contains the correlations of each of the candidate needs with event-related positive affect, negative affect, and affect balance. As can be seen, all 10 needs correlated positively with positive affect, whereas only some of the needs were significantly related to low negative affect. All 10 needs were significantly associated with aggregate affect balance.

Regression comparisons. We next conducted regression comparisons, as in Studies 1 and 2, to test for unique variances. First, positive affect was regressed simultaneously on autonomy, competence, and relatedness. All three predictors were significant at the .01 level (β s = .23, .41, and .27, respectively). Next, negative affect was regressed on these three variables. Only autonomy was significant ($\beta = -.16, p < .05$). Finally, affect balance was regressed on autonomy, competence, and relatedness. All three

predictors supplied significant variance (β s = .25, .16, and .23, respectively; all p s $\leq .01$). We then entered the remaining seven needs. In this most stringent analysis, autonomy was significant and relatedness was marginally significant (β s = .17 and .12), whereas competence was not significant ($\beta = .00$). Self-esteem ($\beta = .38, p < .01$) and money-luxury ($\beta = -.14, p < .05$) were also significant in this analysis.

Most Unsatisfying Event of the Semester

Mean differences in need deprivation scores. Table 6 also presents the mean ratings for each of the 10 candidate needs within the "most unsatisfying" event. Again, we construe these as deprivation scores, because they represent participants' views of what was missing in the unsatisfying experience. As can be seen, the primary reason why the listed events were unsatisfying, according to these ratings, was that experiences of competence were missing. In addition, the other two needs specified by self-determination theory, autonomy and relatedness, were also rated as strongly lacking within unsatisfying experiences. Finally, self-esteem was also rated as strongly absent. In short, this clustering of means is quite consistent with our hypotheses and with earlier findings. However, one interesting difference from earlier studies did emerge: A fifth candidate need, security, was also perceived as strongly lacking within the unsatisfying events. Finally, lack of pleasure-stimulation, popularity-influence, self-actualization-meaning, and physical thriving were deemed to be less responsible for the event's unsatisfying nature, and lack of money-luxury was deemed to be least responsible.

Associations of need deprivation with event-related affect. Table 7 presents the correlations between deprivation scores and event-related affect. As can be seen, only competence and self-esteem, in their absence, were associated with low positive affect. The general lack of associations between dissatisfaction and positive affect parallels the earlier studies, in which few associations were found between satisfaction and negative affect.

In contrast, all 10 of the deprivation scores were correlated with event-related negative affect. The correlation between missing security and event-related negative affect was of the greatest magnitude ($r = .50, p < .01$), followed by missing relatedness and missing self-actualization-meaning (r s = .39 and .35, respectively). All but two of the candidates, popularity-influence and money-luxury, were associated with the compound affect-balance variable. That is, when participants perceived autonomy, competence, relatedness, self-esteem, pleasure-stimulation, physical thriving, self-actualization-meaning, or security as strongly missing within an unsatisfying event, they also reported a higher predominance of negative compared with positive affect within that event.

Regression comparisons. As in the other studies, positive affect was first regressed on autonomy, competence, and relatedness. Only missing competence was significant in this analysis ($\beta = -.20, p < .01$). Next, negative affect was regressed on these three variables. Once again, only competence was significant ($\beta = .24, p < .01$). Finally, and most importantly, the affect-balance variable was regressed on autonomy, competence, and relatedness. Competence was significant in this analysis ($\beta = -.30, p < .01$), and relatedness was marginally significant ($\beta = -.11$); autonomy was nonsignificant. We then entered the remaining seven needs into the

Table 6
Study 3: Mean Salience of Each Candidate Need Within Participants' Most Satisfying and Most Unsatisfying Experiences of the Semester

Candidate need	Presence within the most satisfying event		Absence within the most unsatisfying event	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Self-esteem	3.97 _a	1.00	2.66 _b	1.27
Autonomy	3.77 _b	1.01	2.86 _{ab}	1.11
Competence	3.73 _b	1.15	3.02 _a	1.23
Relatedness	3.66 _b	1.31	2.63 _b	1.32
Pleasure-stimulation	3.38 _c	1.13	2.40 _c	1.05
Self-actualization-meaning	3.24 _c	1.23	2.63 _b	1.15
Security	3.00 _d	1.07	2.77 _b	1.12
Popularity-influence	2.93 _d	1.12	2.37 _c	1.16
Physical thriving	2.91 _d	1.24	2.34 _c	1.23
Money-luxury	2.24 _e	1.21	1.77 _d	1.01

Note. Means within columns not sharing subscripts are significantly different from each other at $p \leq .01$.

Table 7
 Study 3: Correlations of Candidate Needs With Event-Related Affect, Separately
 for Satisfying and Unsatisfying Events

Candidate need	Presence within the most satisfying event			Absence within the most unsatisfying event		
	Positive affect	Negative affect	Affect balance	Positive affect	Negative affect	Affect balance
Self-esteem	.57**	-.28**	.52**	-.13*	.39**	-.36**
Autonomy	.46**	-.18*	.39**	-.03	.19**	-.16**
Competence	.46**	.07	.22**	-.19*	.25**	-.31**
Relatedness	.33**	-.19**	.32**	-.05	.13*	-.13*
Pleasure-stimulation	.40**	-.14*	.33**	-.02	.14*	-.14*
Physical thriving	.36**	-.08	.27**	-.05	.23**	-.19**
Self-actualization-meaning	.32**	-.03	.21**	-.08	.35**	-.30**
Security	.33**	-.15*	.29**	-.02	.50**	-.37**
Popularity-influence	.43**	-.13*	.34**	.06	.23**	-.12
Money-luxury	.18**	-.03	.12	.10	.23**	-.10

* $p < .05$. ** $p < .01$.

equation. In this most stringent analysis, only competence ($\beta = -.22$, $p < .01$), security ($\beta = -.26$, $p < .05$), and self-esteem ($\beta = -.18$, $p < .01$) were significant. Thus, it appears that the absence of competence, self-esteem, and security within an unsatisfying event has the greatest impact on the low-positive and high-negative affect associated with that event.

Discussion

In the first part of Study 3, the basic pattern of findings from Studies 1 and 2 was replicated for a longer time frame. Specifically, self-determination theory's three proposed needs again emerged as important determinants of satisfaction by the "salience" criterion. In addition, all three emerged as important by the "affect" criterion (although competence became nonsignificant in the most stringent simultaneous analysis). Furthermore, self-esteem again emerged as very important by both criteria. These findings help to enhance confidence in the earlier results and also help establish that the sources of satisfaction tend to be the same across different temporal frames.

Study 3 also provided preliminary evidence regarding the important issue of deprivation. Again, it is possible to view psychological needs as qualities whose absence leads to unhappiness and even "deficiency" diseases, as well as qualities whose presence leads to happiness and growth (Maslow, 1954). Because deficiency needs and enhancement needs do not necessarily overlap, to find that the same candidate needs emerge as important by both criteria would strengthen the case for those needs. In this light, the results of Study 3 offered somewhat mixed support for our primary hypotheses. Autonomy, competence, and relatedness again emerged as very important needs by the "salience" criterion (i.e., participants perceived them as strongly missing within unsatisfying events). Furthermore, the absence of all three of the needs specified by self-determination theory was correlated with event-related negative affect. However, the simultaneous analyses revealed that only the absence of competence carried unique predictive variance with respect to event-related affect, indicating that missing autonomy and missing relatedness may be less important determinants of felt dissatisfaction. Once again, self-esteem

emerged as important by both criteria. Finally, security emerged for the first time as a potentially important need, specifically, in association with "most unsatisfying" events.

General Discussion

Summarizing the Results

What are the fundamental psychological needs? The results of these three studies nicely support our new method for addressing this important question. First, we found relatively consistent results across our two criteria for determining needs. This is important because it lends greater confidence to our conclusions, and it also suggests that participants are aware of "what's satisfying about satisfying events." Second, we found largely consistent results across three different time frames (i.e., the most satisfying event of the last week, of the last month, and of the entire semester). This is important because it indicates that our results are not artifacts of the particular time frame addressed. Third, although our results were generally consistent across two different cultures, there were also meaningful and interpretable differences. This is important because it suggests that our measurement approach is able to detect effects consistent with other findings in the literature. Finally, the method yielded results quite consistent with theory, in particular Deci and Ryan's (1985, in press) self-determination theory but also with the many theories that posit self-esteem as a fundamental human need (Epstein, 1990; Greenberg et al., 1995; Leary, 1999). This consistency is important because it suggests that our new approach may supply a fruitful new means of confirming and perhaps extending existing theories of optimal experience.

Specifically, the results lend good support for self-determination theory's proposal that autonomy, competence, and relatedness are basic psychological needs (Deci & Ryan, in press). These three qualities of experience emerged among the four most salient in every sample, and they accounted for independent variance in the affect associated with satisfying events. Accordingly, they better met our two criteria for identifying needs than did six other candidates, including pleasure-stimulation, physical thriving, self-

actualization—meaning, security, popularity—influence, and money—luxury. Thus, it appears that self-determination theory's "big three" needs of autonomy, competence, and relatedness may indeed serve as important foundations on which to build a unified typology of motives, in the same way that the Big Five personality traits have served to unify trait psychology (McCrae & Costa, 1995). In addition to confirming important postulates of self-determination theory, the current research also extends past self-determination theory research in three major ways: by testing autonomy, competence, and relatedness against seven other theoretically derived needs, by introducing a new narrative methodology for studying needs, and by introducing a new criterion for identifying "true" needs.

It is interesting that if one were to pick a single need that is most important to satisfy in the United States, the current data suggest it would be self-esteem. Not only was self-esteem at the top of the list in all three U.S. samples, it also accounted for the most independent variation in event-related affect. Self-determination theory does not have a way to account for these findings, except perhaps to consider self-esteem as a well-being outcome rather than as a predictor. However, given the prominence of self-esteem in so many other need-based theories, it might be imprudent to consign self-esteem to the outcome category rather than considering it as a need in its own right. Another way for self-determination theory to account for these results would be to consider self-esteem as a broader manifestation of the competence need. However, even though they may ultimately share roots, competence and self-esteem were empirically separable in our research. Accordingly, our results concerning "most satisfying events" suggest the preliminary conclusion that there may be *four* fundamental psychological needs, not three: autonomy, competence, relatedness, and self-esteem.

In support of this idea is that self-esteem, autonomy, competence, and relatedness also ranked at the top within the South Korean sample, just as in the U.S. samples. As mentioned earlier, the appearance of autonomy within this group is important because it supports Deci and Ryan's claim that autonomy is a universal need (Deci & Ryan, in press), a claim that has been recently questioned (Markus et al., 1996). Notably, however, in South Korea the single most important need to satisfy appears to be relatedness. Given the collectivistic and communal orientation that characterizes Korean culture, this finding makes intuitive sense (Choi & Choi, 1994; Diener, Suh, Smith, & Shao, 1995; Kim, 1994). Although some might feel that this finding poses a challenge to our theory, we would again stress that our approach only specified a set of important needs, and it made no predictions regarding relative orderings within this set. Thus, in sum, it appears that both universalist and cross-culturalist perspectives concerning fundamental psychological needs may be correct, in different ways. That is, although all humans may need certain basic experiences to be happy, it appears that different cultures may emphasize or condone some experiences more than others, leading to meaningful variations within the basic set. Of course, the cross-cultural findings remain to be replicated, ideally in other collectivist cultures besides South Korea.

Study 3 replicated the Study 1 and Study 2 effects concerning "what's satisfying about satisfying events," and it also supplied interesting preliminary information about "what's unsatisfying about unsatisfying events." The lack of autonomy, competence, and relatedness emerged as most salient within participants' direct

ratings of their most unsatisfying events, echoing the earlier findings concerning satisfying events and further supporting self-determination theory's assumption that these are fundamental needs. Again, self-esteem was also important by this criterion. Of interest is that lack of security also emerged as a fifth prominent feature of unsatisfying events, consistent with deficiency-based models of needs (Maslow, 1954). It appears that when things go wrong, people may strongly wish for the safety and predictability that they often take for granted.

One other finding is notable: Results appear to be robust with respect to relevant individual differences. In Study 1, variations in individual need-preferences did not moderate the main effects of need experiences on event-related affect, as would be expected by a "matching" hypothesis in which experiences are especially satisfying if they accord with a person's preferences (Oishi, Diener, Suh, & Lucas, 1999). Additionally, in Study 2 there were no interactions of needs with culture (U.S. vs. Korean) in predicting event-related affect. In sum, then, we found good support for our universalist assumptions regarding the importance of autonomy, competence, and relatedness (Deci & Ryan, in press).⁴

What do we mean by "universal" needs? Although space precludes thorough consideration of this question, we will at least state our assumptions. Psychological needs are evolved desires that can be found within every member of the human species (Deci & Ryan, in press). These inborn yearnings carry little information about exactly what behaviors to engage in, a fact that allows for considerable behavioral plasticity. Instead, the needs tend to pull people toward the same general experiences and incentives within almost any behavioral domain. When a person behaves successfully within a particular life domain, then beneficial adaptive consequences and rewarding experiences ensue. These experiences help reinforce the particular behavior, causing the individual to seek further challenges and satisfactions within that domain. Thus, we suggest that psychological needs evolved, in part, to help individuals find conducive social and vocational niches and to motivate them to develop their skills further within those niches (Buss, 1997; Sheldon, in press). These speculations also await further research.

Rethinking the Hierarchy Concept

Maslow's (1954) five-level hierarchical conception of needs has received little research support, although it remains popular in introductory-psychology textbooks. The current results suggest at least two fruitful ways of thinking about the need-hierarchy concept. One way to define a hierarchy is in terms of a prioritization of the relative importance of different elements. In such an approach, one may ask, "Which needs head the list, in terms of their strong salience to participants, and their demonstrated impact upon health and thriving outcomes?" Viewed in this way, our results suggest that autonomy, relatedness, competence, and self-esteem should be placed at the "top" of the hierarchy (although, again, the relative ordering of these four needs may vary from culture to

⁴ Of course, it is difficult to draw conclusions from null effects. It may be that further studies, using different or better measures of individual differences in need preferences, would find more support for the matching hypothesis.

culture). Security, self-actualization–meaning, and physical thriving occupy a position of lower importance within the hierarchy. Finally, popularity–influence and money–luxury are of little or no importance, and money–luxury experiences may even be detrimental to satisfaction, at least considered relative to the other needs.

Notably, in such a “list”-based conception of hierarchy, there is no assumption that satisfaction of any particular need is a precondition for the satisfaction of any other need. However, one reason for the perennial appeal of Maslow’s theory is that it acknowledges a seemingly obvious truism: that it is easier to focus on the “finer” things if certain basics are taken care of (Oishi, Diener, Lucas, & Suh, 1999). In fact, although the complex five-level hierarchy proposed by Maslow has not withstood the test of time, there has been some support for a two-level distinction between “deficiency” or “security” needs on the one hand and “enhancement” or “growth” needs on the other (Wahbah & Bridwell, 1976). Our results may offer further support for such a distinction. First, in Study 3 a somewhat different pattern of findings was found regarding participants’ most unsatisfying (deficient) experiences compared with their most satisfying (enhancing) experiences. Specifically, insecurity emerged as very salient within participants’ “most unsatisfying” events and as a strong predictor of affect within such events. This is consistent with Maslow’s assumption that security needs must be taken care of before growth and positive experience can become predominant (see also Oishi, Diener, Lucas, & Suh, 1999). In addition, autonomy and relatedness did not as strongly influence the affect associated with unsatisfying events, suggesting that these two qualities of experience may be more important for obtaining enhancement than for avoiding deficiencies.

Thus, we suggest that one possible way to interpret the current results is to say that autonomy and relatedness needs occupy the higher, “enhancement” level of a two-tier hierarchy, whereas security occupies the lower “deficiency” level, and self-esteem and competence exist and have influence at both levels. Such an arrangement would explain why autonomy and relatedness were relatively less important within unsatisfying events, why security was relatively more important within unsatisfying events, and why self-esteem and competence were important for both types of events. This model would also take into account the fact that self-esteem can be either “contingent” or “true” (Deci & Ryan, 1995; Kernis, Brown, & Brody, 2000), that is, a source of anxiety or of genuine satisfaction, and also the fact that competence behaviors can be either appetitive or aversive (Elliot & Church, 1997; Elliot & Sheldon, 1997), that is, guided by extrinsic pressures or by intrinsic interests (Ryan & Deci, 2000). However, further research will be necessary to validate this preliminary suggestion and also to explore whether there is any contingent relationship between “lower”-level need-satisfaction and the subsequent satisfaction of “higher-level” needs.

Limitations and Future Directions

One potential limitation of the current research is that rare-but-powerful experiences, such as moments of spiritual conversion or personal transformation, are probably underrepresented by using the current methodology (Emmons, 1999); thus asking about “the most satisfying event of your whole life” might yield important

information. Relatedly, the typical frequency or category breadth of different types of experiences should be examined as additional predictive variables (e.g., winning the lottery, a low-frequency event, might for that reason be more satisfying than a hug from one’s spouse). A second limitation is our reliance on self-reported outcome variables. It would be desirable to show that need satisfaction is associated with other more objective indicators of thriving, such as physical health and successful task performance. Perhaps psychological needs will prove to be less important for such outcomes, compared with their effects on mood. Another limitation is our exclusive use of college-age individuals; perhaps older adults would find different kinds of experiences most satisfying, such as self-actualization–meaning or security. Additionally, our participants were relatively affluent and high-functioning; perhaps different candidate needs, such as money–luxury or popularity–influence, would emerge as most satisfying in stressed or impoverished populations (Biswas-Diener & Diener, 2000), if for no other reason than that they help individuals obtain the basic requirements of living. Also, it will be necessary to examine the effects of cultural variables and media on construals of satisfaction; perhaps the very concept of satisfaction is inextricably tied to western-style psychological needs (Markus et al., 1996). Finally, it will be important to replicate the current findings using other question wordings (Schwarz & Strack, 1999), and also with other methodologies besides “most satisfying event” descriptions, such as daily diary, experience sampling, or ethnographic approaches. In addition, other candidate needs beyond our 10 might be examined, such as needs for cognition, closure, or self-consistency.

Conclusion

What’s satisfying about satisfying events? In other words, what experiential contents and characteristics make people happiest, and thus qualify as psychological needs? According to the current research, the answer is autonomy, competence, relatedness, and self-esteem. Security may also be a need, which becomes salient in times of privation. Pleasure–stimulation, self-actualization–meaning, popularity–influence, and physical thriving are less important, and we would tend to deny them “need” status. Least deserving of need status is money–luxury. Although further work is required, we suggest that these findings may have strong relevance for society’s goal of providing optimal social and developmental environments for its citizens (Kahneman, Diener & Schwarz, 1999). In other words, it appears that authorities and social planners should try to help their charges obtain regular experiences of autonomy, competence, relatedness, and self-esteem in order to ensure that they thrive.

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Appendix

Labels and Conceptual Definitions of Needs Used in the Measure of Individual Differences in Need Preferences in Study 1

1. *Autonomy-independence*: Feeling like you are the cause of your own actions rather than feeling that external forces or pressures are the cause of your actions.
2. *Competence-effectance*: Feeling that you are very capable and effective in your actions rather than feeling incompetent or ineffective.
3. *Relatedness-belongingness*: Feeling that you have regular intimate contact with people who care about you rather than feeling lonely and uncared for.
4. *Self-actualization-meaning*: Feeling that you are developing your best potentials and making life meaningful rather than feeling stagnant and that life does not have much meaning.
5. *Security-control*: Feeling safe and in control of your life rather than feeling uncertain and threatened by your circumstances.
6. *Money-luxury*: Feeling that you have plenty of money to buy most of what you want rather than feeling like a poor person who has no nice possessions.

7. *Influence-popularity*: Feeling that you are liked, respected, and have influence over others rather than feeling like a person whose advice or opinions nobody is interested in.

8. *Physical-bodily*: Feeling that your body is healthy and well-taken care of rather than feeling out of shape or unhealthy.

9. *Self esteem-self-respect*: Feeling that you are a worthy person who is as good as anyone else rather than feeling like a “loser.”

10. *Pleasure-stimulation*: Feeling that you get plenty of enjoyment and pleasure rather than feeling bored and understimulated by life.

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