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Cross-Cultural Evidence for the Fundamental Features of Extraversion

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Psychologists have not determined the defining characteristics of extraversion. In four studies, the authors tested the hypothesis that extraversion facets are linked by reward sensitivity. According to this hypothesis, only facets that reflect reward sensitivity should load on a higher order extraversion factor. This model was tested against a model in which sociability links the facets. The authors also tested the generalizability of the model in a diverse sample of participants from 39 nations, and they tested the model using widely used extraversion scales. Results of all studies indicate that only facets that reflect reward sensitivity load on a higher order extraversion factor and that this factor correlates strongly with pleasant affect. Although sociability is undoubtedly an important part of extraversion, these results suggest that extraverts' sociability may be a by-product of reward sensitivity, rather than the core feature of the trait.

Extraversion has a rich history in the field of personality psychology. The roots of this tradition extend as far back as the work of Jung (1921/1971) and James (1907), and the trait is central to current conceptualizations of personality. Most modern taxonomic approaches to personality and most major personality inventories include some form of extraversion (Watson & Clark, 1997). Yet after almost a century of study, psychologists are still unsure of the fundamental nature and defining characteristics of the extraversion personality dimension. Does extraversion represent a tendency to be sociable, or is it a tendency to experience positive emotions? Is the extravert a fundamentally dominant and self-confident individual, or is he or she a fundamentally warm person? Although the lay person may define an extravert simply as one who is sociable, the trait of extraversion as studied by personality psychologists is more complex: There are a number of conceptually distinct facets that consistently cohere to form a broad, higher order trait.

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Understanding the Common Variance Among Extraversion Facets

To understand the fundamental features of extraversion, it is first necessary to understand how theories of the trait have developed (for a review, see Watson & Clark, 1997). Although the earliest theories of extraversion emerged before the widespread use of modern factor analysis (e.g., Jung, 1921/1971), later researchers quickly adopted factor analytic techniques to identify which primary traits went together to form the higher order trait. The factors that emerged were then interpreted by examining the content of the factors; once the content was understood, theories of extraversion could be developed. Unfortunately, the interpretation of factors that emerge from factor analyses is rarely unequivocal. In this article, we examine two possible conclusions about the nature of the higher order extraversion factor: The core (or shared variance) of the trait may reflect (a) sociability or (b) reward sensitivity.

It is necessary first to define the terms that we will use throughout this article. We use the term *extraversion* inclusively, referring to the broad factor that has emerged from various factor analyses of trait adjectives, questionnaire items, and primary traits. Al-

though the nature of this trait changes across various theorists' models, Watson and Clark (1997) argued that six facets have been included at one point or another in the different models of extraversion. These six facets are venturesome (feelings of excitement seeking and desire for change), affiliation (feelings of warmth and gregariousness), positive affectivity (feelings of joy and enthusiasm), energy (feeling lively and active), ascendance (feeling dominant or being an exhibitionist), and ambition (valuing achievement and endurance). Depue and Collins (1999) provided a more succinct model, arguing that there are three central characteristics of extraversion: ". . . affiliation (enjoying and valuing close interpersonal bonds, being warm and affectionate) and agency (being socially dominant, enjoying leadership roles, being assertive, being exhibitionistic, and having a sense of potency in accomplishing goals)" (p. 491), as well as impulsivity, which they (like Watson and Clark) ultimately argued should not be included in extraversion.

We use the term *sociability* simply to refer to individual differences in the enjoyment of social activities and the preference for being with others over being alone. Sociable individuals should be more likely to enjoy parties and other large gatherings, whereas less sociable individuals should be more likely to enjoy being alone. This sociability component is clearly included in most theorists' description of the extravert; but sociability is a narrower construct than extraversion. Sociable individuals react to whether a situation provides the opportunity to interact with other people.

Sociability has not always been used in precisely this way in the literature. Depue and Collins (1999), for example, stated that sociability is synonymous with *affiliation* and that both reflect "enjoying and valuing close interpersonal bonds and being warm and affectionate" (p. 492). We believe that it is necessary to distinguish between enjoyment of social situations and enjoyment of "close interpersonal bonds." We refer to the former as sociability and the latter as affiliation.

Our analysis also requires some way to separate sociability from affiliation. In other words, we wish to assess whether certain individuals enjoy situations simply because those situations involve interactions with other people. Unfortunately, it is difficult to create such a scale, because social situations often (though not exclusively) involve warm interactions with friends and family. For example, the statement "I enjoy spending time with others" can refer to spending time either with friends and family members or with people in general. It is impossible to determine whether an affirmative response to this statement reflects sociability or affiliation. Therefore, for the purposes of this study, it was necessary to create a new scale.

Our Social Interaction Scale assesses preference for social activity in a way that is different from traditional extraversion measures. Specifically, the items on this scale were written to assess whether a person bases his or her enjoyment of a situation primarily on the extent to which the situation provides opportunities for social interaction. On the basis of this principle, we created questions that tapped three types of preference for social interaction: (a) reverse-scored enjoyment of nonsocial situations (e.g., "You enjoy being alone," "You enjoy reading quietly"), (b) preference for specific social situations over equally enjoyable (or unenjoyable) nonsocial situations (e.g., "You prefer working on projects alone rather than in groups," "When relaxing, you prefer being with others rather than being alone"), and (c) participation in social activities without describing specific activities (e.g., "You rarely spend time alone," "You always prefer being with others to spending time alone"). We often use modifiers such as "always," "often," or "rarely" to emphasize that the person who responds affirmatively to these items will almost always choose a social situation over a nonsocial situation, even when there is an attractive nonsocial alternative.

In addition, we will discuss and examine two additional facets of extraversion: ascendance and venturesome. Ascendance is comparable to Watson and Clark's (1997) ascendance trait as well as Costa and McCrae's (1992) assertiveness facet and Depue and Collins' (1999) agency component. It reflects "social dominance and the enjoyment of leadership roles, assertiveness, exhibitionism, and a subjective sense of potency in accomplishing goals" (Depue & Collins, 1999, p. 492). Venturesome is comparable to Watson and Clark's venturesome trait and Costa and McCrae's excitement-seeking facet. Venturesome individuals seek out and enjoy exciting, stimulating situations.

Ultimately, we seek to understand why these facets are linked to form a higher order trait of extraversion. Specifically, we examine whether the core feature that links the facets is sociability or *reward sensitivity*. Individual differences in reward sensitivity reflect an underlying motivation system first proposed by Gray (1970) and later elaborated on by Fowles (1987) and Depue and Collins (1999), among others. According to Gray, there are three fundamental biologically based motivational systems in the brain: the Behavioral Activation System (BAS), which regulates reactions to signals of conditioned reward and nonpunishment; the Behavioral Inhibition System (BIS), which regulates reactions to signals of conditioned punishment and nonreward; and the Fight–Flight System, which regulates the response to signals of unconditioned punishment and nonreward. Depue and Collins argued that extraverts are characterized by a strong BAS and that extraversion can be interpreted as reward sensitivity.

The function of the BAS is to motivate and guide goal-directed behavior. Activity in this system usually co-occurs with feelings of pleasant affect. According to Depue and Collins (1999),

> Exposure to . . . incentive stimuli (or activation of their central representation) elicits an incentive motivational state that facilitates and guides approach behavior to a goal. In humans, incentive motivational states are associated with strong positive affect characterized by feelings of desire, wanting, excitement, enthusiasm, energy, potency, and self-efficacy. (p. 495)

Individual differences in reward sensitivity should result in differences in approach behavior as well as individual differences in the experience of pleasant affect. The challenge for reward sensitivity models of extraversion is to explain why extraverts appear to be more sociable than introverts when the underlying individual difference reflects differential strength of incentive motivation and reward sensitivity.

Sociability-as-Core Model

Extraversion is often equated with sociability in popular speech (McCrae & Costa, 1987). This folk conception of the trait is supported by empirical evidence: When McCrae and Costa (1987) examined adjectives that loaded strongly on an extraversion factor, they found that sociable, fun-loving, affectionate, friendly, and talkative were the highest loading items. On the basis of this evidence, McCrae and Costa (1987) concluded that "sociability—

the enjoyment of others' company—seems to be the core" (p. 87) of the trait.

This conclusion about the core feature of extraversion is often implicit in research involving the trait, especially in research examining the relation between extraversion and pleasant affect. For example, researchers have often used extraversion to test hypotheses about person–situation fit (e.g., Diener, Larsen, & Emmons, 1984; Emmons & Diener, 1986; Emmons, Diener, & Larsen, 1986), assuming that social situations provide a good fit for extraverts' personality. According to this idea, extraverts should be more likely than introverts to choose social situations over nonsocial situations, and extraverts should be more likely than introverts to experience pleasant affect in social situations.

Yet, there are a number of reasons why researchers must treat this interpretation cautiously. First, it is unclear whether McCrae and Costa (1987) used sociability to mean a broad tendency to enjoy social situations (as we do in this article) or to mean warmth, affection, and a tendency to enjoy close interpersonal bonds with friends and family members (what we call affiliation). If it is the latter, we would expect all facets of extraversion to be linked by their common association with affiliation scales. In other words, extraversion facets like ascendance and venturesome should show stronger correlations with affiliation scales than with each other. However, Watson and Clark (1997) showed that this is not the case. In fact, in Watson and Clark's studies, the different facets of extraversion were more strongly related to positive affect than to each other.

It is possible that the core of extraversion reflects a broader form of sociability. Extraverts may simply enjoy social interactions, and the different facets of extraversion may reflect different manifestations of this underlying individual difference. One could be sociable by spending time with friends and family members (affiliation), hy leading groups of people (ascendance), or by engaging in exciting, adventurous social activities (venturesome). If so, one would not expect correlations with any one particular facet to be particularly high, as the core sociability component is only captured hy the intersection of the various facets.

Unfortunately, theories that posit sociability as the core of the extraversion trait cannot explain one robust finding from the extraversion literature: Pleasant affect is strongly correlated with extraversion. The rationale guiding most early research on the extraversion/pleasant-affect relation was that the stable trait of extraversion influenced the more transient feelings of pleasant affect (see e.g., Argyle & Lu, 1990). Hence, most early research focused on pleasant affect as an outcome of extraversion (Watson & Clark, 1997). Pavot, Diener, and Fujita (1990), for example, postulated two indirect mechanisms by which extraversion could lead to high pleasant affect. First, they suggested that social contact may lead to greater pleasant affect whether one is extraverted or not. If extraverts spend more time in pleasant-affect-inducing social situations, they should experience greater amounts of positive emotions. In support of this argument, Emmons and Diener (1986) found that the amount of time people spend in social situations is positively correlated with the level of pleasant affect that they report, and Clark and Watson (1988; Watson, 1988) found that certain types of social activity tend to raise state levels of pleasant affect. In a direct test of the hypothesis, Pavot et al. (1990) collected on-line mood data from both introverts and extraverts. They found that both extraverted and introverted participants reported more pleasant affect in social situations than in nonsocial situations. In other words, both extraverts and introverts benefit from social interaction. However, extraverted participants did not spend a greater amount of time in social situations than introverted participants and reported more pleasant affect even when alone, both indicating that some additional factor had to be accounting for their greater reported happiness.

According to Pavot et al.'s (1990) second hypothesis, society may require both extraverts and introverts to engage in many social activities—people are often required to live, work, and generally interact with others. Extraverts may enjoy these situations more than introverts do and may therefore experience more overall happiness. If this hypothesis were true, both extraverts and introverts should spend similar amounts of time in social and nonsocial situations; yet extraverts should report more happiness in social situations. Diener, Larsen, and Emmons (1984) found that extraversion correlated with pleasant affect only in social situations. However, through the use of experience sampling methods, Pavot et al. found that extraverts were happier than introverts even when alone. Thus, evidence for an indirect effect explanation is mixed and it is unclear why pleasant affect is such a strong correlate of extraversion if sociability forms the core of the trait.

Reward-Sensitivity-as-Core Model

An alternative to the sociability-as-core model is the reward-sensitivity-as-core model. The rationale underlying this model is that each facet of extraversion reflects a distinct manifestation of an underlying positive incentive motivational system (Depue & Collins, 1999). If reward sensitivity is the core, facets that are the most direct manifestations of the core should show the strongest relations with the other facets of extraversion. Depue and Collins argued that pleasant affect and activity are direct manifestations of their positive incentive motivational system; an idea that corresponds well with evidence showing that the facets of extraversion show stronger correlations with pleasant affect than with each other.

Watson and Clark (1997), for example, argued that at the core of the broad trait of extraversion, and the "glue" that holds the specific facets together, is the trait of positive emotionality (a view also proposed by Tellegen, 1985). In support of this argument, Watson and Clark presented evidence that all facets of extraversion correlate moderately strongly with the positive affectivity component but less well with each other. Furthermore, they showed that the trait of extraversion as a whole, as well as each of the specific facets, correlates moderately strongly with trait measures of positive affect.

Can the existence of stable individual differences in sensitivity to positive stimuli explain the relations among the facets of extraversion? In other words, can Gray's (1970) theory explain why happy people are also more gregarious, warm, ascendant, and prone to seek excitement? To answer this question we must be able to theoretically and empirically link each of the facets of extraversion to reward sensitivity; and to do so we must understand the function of the BAS. This system is not simply affective, providing a concomitant signal of the system at work, but it is also motivational. Just as pain not only signals that we should remove our hand from a hot stove but also motivates our withdrawal, positive affect should increase the likelihood that we will approach rewarding stimuli. Thus, when exposed to a potentially reinforcing stimulus, the strong BAS individual should experience greater energy,

desire, and self-confidence, as well as greater motivation to approach that stimulus than the weak BAS individual. Notice that in this model extraverts have no inherent motivation to be more sociable. This model predicts that extraverts (or more precisely, reward-sensitive individuals) should not be more likely to engage in social situations, but rather they should only be more likely to engage in rewarding situations.

If extraverts are simply sensitive to rewards, then why do extraverts appear to be more sociable than introverts? In other words, why are extraverts particularly sensitive to social rewards? We believe that they are not. Instead, we argue that social situations (particularly social situations involving warmth, affection, and close emotional bonds) are especially rewarding. Empirical evidence for this argument comes from experience sampling studies that show that most people experience greater pleasant affect when they are with others than when they are alone (e.g., Pavot et al., 1990). Even introverts report more pleasant affect when they are engaged in social situations. Furthermore, Baumeister and Leary (1995) offered a theoretical reason for the observed rewardingness of social situations. They argued that (a) there is an inherent, universal need to form close emotional bonds with other people, (b) this need can be distinguished from a need for "mere social contact" (p. 500), and (c) the former is associated with positive implications for health, adjustment, and well-being. The apparent sociability of extraverts that has been found empirically could then be explained by the greater opportunity for rewards afforded by many social situations.

The above prediction nicely parallels a set of findings from a separate line of research into the effects of momentary positive moods on behavior. Cunningham (1988b) also suggested that social situations provide more rewards for individuals than nonsocial situations. He posited that people in happy moods are more sensitive to these rewards (because of mood-congruent memory effects) and are therefore more likely to enjoy rewarding social situations. In a test of this hypothesis, Cunningham induced a positive mood in a group of participants and asked them to rate various social and nonsocial situations. Participants in the pleasant mood condition reported higher ratings than participants in a neutral mood condition for social situations only if those situations were active or rewarding. Active, rewarding, nonsocial situations were also preferred by the happy participants, but there were no differences between conditions in ratings of nonrewarding-social or nonrewarding-nonsocial situations.

In fact, Cunningham's (1988b) description of the effects of elation is remarkably similar to Watson and Clark's (1997) description of the facets of extraversion. Cunningham (1998b) stated that pleasant affect increases the likelihood of

> expansive, social, approach behaviors, including actions (a) to enhance one's close relationships, such as interaction with friends, family, and classmates, (b) to improve one's social community, such as prosocial behavior, (c) to enhance self-esteem, such as undertaking cognitive or physical challenges that could improve the self-concept, and (d) involving one's personal resources and ecology, including leisure behavior such as enjoying one's records and more strenuous behavior. . . (p. 310)

The first, third, and fourth of these effects correspond to three of Watson and Clark's (1997) four central facets of extraversion: affiliation, ascendance, and activity (the fourth is positive affect itself). Each of these effects of elation are motivated not by a desire to be social but rather by the expansive motivation to approach rewards.

In summary, theories of reward sensitivity suggest that extraverts have strong incentive motivation systems. This system may be directly tied to individual differences in pleasant affect and approach behavior. Therefore, extraverts may be more likely to approach rewarding situations. Because social situations are theoretically and empirically rewarding, extraverts' reward sensitivity may manifest itself as greater sociability.

Testing the Competing Models

Testing the competing models should be a straightforward task. If extraversion is a single multifaceted dimension, all facets of extraversion should cohere to form a single higher order trait. Personality researchers should be able to identify the variance that is common to all facets. To test which competing model best describes the extraversion dimension, researchers could then examine the nature of this common variance, focusing on whether it reflects sociability or sensitivity to rewards. If sociability measures are strongly related to a higher order extraversion trait, this would suggest that sociability forms the core. If reward sensitivity measures are strongly related to the trait, this would suggest that reward sensitivity forms the core. Unfortunately, most extraversion scales confound the two constructs: Extraversion items often reflect the tendency to engage in rewarding social activities, such as spending time with friends and family, engaging in goal-directed and active social behavior, and participating in exciting leisure activities. Extraversion items rarely tap sociability in a way that does not make reference to enjoyment of rewarding activities. When they do, the items may be vague enough for respondents to infer that the items include warm and affectionate social interactions with friends.

The new Social Interaction Scale developed for this study assesses a broad tendency to enjoy and prefer social activities simply because these activities provide the opportunity for social interaction. Strong correlations between this Social Interaction Scale and an extraversion factor would provide evidence for the sociability-as-core model. On the other hand, because pleasant affect is postulated to be a fairly direct outcome of the reward sensitivity system (Depue & Collins, 1999), strong correlations between extraversion and pleasant affect would provide evidence for the reward-sensitivity-as-core model. Thus, we can test the competing models by comparing the associations between traditional extraversion scales and the new Social Interaction Scale and pleasant affect.

Extraversion Across Cultures

By framing the trait of extraversion as the manifestation of individual differences in sensitivity to rewards, we make the claim that extraversion results from an interplay of factors that exist within the individual (individual differences in sensitivity to reward) and factors that exist outside the individual (the fact that social situations tend to be rewarding). Thus, external factors such as culture may influence the structure of extraversion and its relation to pleasant affect by influencing these external factors. In Western cultures, in which most extraversion research has been conducted, social contact may be seen as "fun" and "rewarding" (and therefore may be strongly related to pleasant affect), whereas

social behavior in other cultures may be motivated more by the desire for harmony and by feelings of respect and duty.

One dimension of culture that may be particularly useful in identifying systematic differences in the processes underlying the extraversion/pleasant-affect relation is individualism–collectivism (Triandis, 1989) or independent–interdependent conceptualizations of the self (Markus & Kitayama, 1991). The trait of extraversion represents systematic differences in one's behavior toward and feelings about others. Similarly, the individualism–collectivism dimension reflects differences in the way the self is seen in relation to others. A defining feature of this dimension is the degree to which people view the self as an autonomous, self-sufficient entity. In individualist cultures, people often try to distinguish themselves from one another, whereas in collectivist cultures, harmony with in-group members is a more central goal. Thus, social contact may serve different purposes and may result from different motivations in different cultures. In individualistic cultures, in which feelings and emotions are attended to more strongly (Suh, Diener, Oishi, & Triandis, 1998), people may engage in social behaviors that are fun and rewarding. The feelings that these situations elicit may influence participation in the situations. In collectivist cultures, in which feelings and emotions have less influence compared with norms and roles, positive emotions may not prompt social behavior or feelings of sociability. Thus, we may see different patterns of relations among facets of extraversion in different nations. For example, pleasant affect may be less strongly related to extraversion in collectivistic cultures.

We are not arguing that extraversion and individualism are related. Instead, we are suggesting that individualism may moderate the strength of the relation between extraversion and pleasant affect. In collectivist cultures, social behavior may be motivated by norms and responsibilities rather than by the desire for fun and enjoyment. Thus, pleasant affect may be less likely to motivate approach toward social activity. If so, the relation between pleasant affect and extraversion may be weaker in these cultures.

Expectations

In this article, we test two competing models by examining the structure of extraversion and the relation between extraversion and pleasant affect. The first hypothesis is that the higher order trait of extraversion represents a tendency to enjoy social interaction. According to this model, the variance that is common to extraversion facets should be strongly related to a measure of social interaction, even if that measure does not describe enjoyment of rewarding situations. Thus, all facets included in our study (including our new Social Interaction Scale) should build on a single higher order extraversion factor. This higher order factor should correlate moderately strongly with pleasant affect (because in this model, pleasant affect is an indirect effect of sociability and is mediated by greater social activity).

On the basis of Cunningham's (1988a, 1988b) experimental work on the effects of elation, Watson and Clark's (1997) correlational studies of pleasant affect and social behavior, and Depue and Collins's (1999) incentive motivational theory of extraversion, we believe that this model will not describe the data. Instead, we hypothesize that only the facets of affiliation, ascendance, and venturesome reflect manifestations of underlying reward sensitivity (they each describe rewarding social situations and activities), and therefore only these facets should load on a higher order extraversion factor. This higher order factor should then correlate strongly with pleasant affect, because pleasant affect is a direct outcome of the reward system that is responsible for the extraversion facets (Depue & Collins, 1999). Our new Social Interaction Scale should not load on a higher order extraversion factor, despite the strong social component of this scale. Additionally, we predict that this social interaction facet will not correlate with pleasant affect.

We also examine the relations among the facets of extraversion and pleasant affect in college students from 39 nations other than the United States. This allows us to test the generalizability of the extraversion/pleasant-affect relation across a number of diverse nations and to systematically examine the relations among the different facets of extraversion in non-Western cultures. Finally, we test the model using established extraversion scales and using a revised Social Interaction Scale.

Scale Validation

Because existing scales confound enjoyment of social situations with enjoyment of rewarding social situations, we developed a new Extraversion Scale designed to test our hypotheses. The 31-item scale (items are listed in Appendix) consists of four facets, three of which correspond to facets in Watson and Clark's (1997) hierarchical model of extraversion and Costa and McCrae's (1992) Revised NEO Personality Inventory (NEO-PI-R) scale (corresponding NEO-PI-R labels in parentheses): Affiliation (Warmth), Ascendance (Assertiveness), and Venturesome (Excitement Seeking). The fourth subscale (Social Interaction) measures preference for social interaction.[1]

The validity of our results rest on the psychometric properties of these scales. For this reason, we present reliability and validity information from the four studies and two separate validation samples before we discuss the specific results and model testing (reliabilities for the facet scales are presented in Table 1). One hundred twenty-one U.S. psychology students were recruited to test the reliability and validity of the Extraversion Scale. The 121 participants in the validation phase of the study completed the NEO-PI-R Extraversion scale (Costa & McCrae, 1992), two of the Multidimensional Personality Questionnaire (MPQ) Positive Emotionality scales—social potency and social closeness—(which were averaged to create a composite scale; Tellegen & Waller, 1994), and the Eysenck Personality Questionnaire (EPQ) Extraversion scale (Eysenck & Eysenck, 1975). As can be seen in Table 2, the new composite Extraversion Scale correlates between .55 and .58 with these additional Extraversion scales. The correlations among the other scales are only slightly higher. Because our scale includes certain components and excludes other components that traditional scales usually include, we would not expect our scale to show perfect correlations with existing scales.

[1] This 31-item scale was derived from a larger 42-item scale administered to the validation sample and the samples from Study 1 and Study 2. An exploratory principal-components analysis with varimax rotation, a principal-components analysis with an oblique (oblimax) rotation, and a principal axis factor analysis with varimax rotation were performed separately in each sample. Items that loaded consistently in each sample in all three factor analytic methods were retained for the final version of the scale.

Table 1
Extraversion Facet Scale Reliabilities

Scale	Validity study	Study 1	Study 2	Study 3	Study 4
Affiliation	.90	.84	.75	.84	.79
Ascendance	.82	.83	.76	.79	.78
Venturesome	.71	.72	.58	.80	.73
Social Interaction	.79	.81	.75	.82	.87

Note. Validity study, $n = 121$; Study 1, $n = 404$; Study 2, $n = 5{,}842$; Study 3, $n = 134$; Study 4, $n = 131$. Reliability for the revised 17-item Social Interaction Scale is reported in Study 4.

We also compared our subscales with the facet subscales of the NEO-PI-R in the validation sample and in Studies 3 and 4 (see Table 3). The correlations in Table 3 shown in boldface are those that we would expect to be high given the intended content of our subscales. Our Affiliation scale correlates moderately strongly with the NEO-PI-R Warmth scale, and our Ascendance scale correlates moderately strongly with the NEO-PI-R Assertiveness scale. Similarly, our Venturesome scale correlates moderately strongly with the NEO-PI-R Excitement-Seeking scale (although it also correlates strongly with Gregariousness). Our Social Interaction scale correlates with the NEO-PI-R Gregariousness scale, as we expected. It is important to note, however, that the NEO-PI-R Gregariousness scale correlates .45, .43, and .43 with the NEO-PI-R Positive Emotions subscale, whereas our Social Interaction scale correlates only -.05, .05, and .06, in the validity study, Study 3, and Study 4, respectively. This suggests that the NEO-PI-R Gregariousness scale has a positive emotionality component that is not included in our Social Interaction Scale, just as we intended. Given the content of the NEO-PI-R Gregariousness subscale (e.g., "I'd rather vacation at a popular beach than an isolated cabin in the woods" and "I enjoy parties with lots of people"), it is probable that it to some extent captures the sensitivity-to-rewards construct that we wished to avoid in this theoretical analysis. We should also note that our Social Interaction Scale correlated only -.04 ($p = .03$) and -.06 (*ns*) with unpleasant affect in the international sample (Study 2) and the U.S. sample (Study 1), respectively. Thus, our Social Interaction Scale is not confounded with unpleasant affect either.

Finally, we recruited an additional 55 participants to test whether our Social Interaction Scale correlated with actual self-reported social activity. Participants reported the number of social activities they engaged in, the number of friends they saw, and the percentage of time spent in social activities during the previous weekend. These three variables were standardized and averaged to create an overall index of social activity. This index correlated .45 ($p < .001$) with our Social Interaction Scale. This value is higher than the correlation between extraversion and social activity reported by Watson, Clark, and McIntyre (1990, cited in Watson & Clark, 1997). Extraversion (as measured by the EPQ), for example, correlated .31 with mean social activity.

The strong correlations with other Extraversion scales illustrates that the new Extraversion Scale has convergent validity. Furthermore, our subscales exhibit strong convergent and discriminant validity—they correlate moderately strongly with similar NEO-PI-R subscales. The Social Interaction Scale also shows criterion validity, predicting the number of social activities in which people engage. Importantly, our social interaction facet seems to have separated feelings of sociability from feelings of pleasant affect.

Study 1

Method

Participants. The analyses reported in Study 1 are based on the responses of 443 college students from two large Midwestern universities in the United States. Participants completed a questionnaire in return for credit in an introductory psychology class. Fifty-two percent were men, 48% were women; and 94% were between the ages of 18 and 25. Only the 404 respondents with complete data were used in the structural equation modeling analyses.

Measures. A new 31-item scale was used to measure the affiliation, ascendance, venturesome, and social interaction facets. Reliabilities are shown in Table 1. Participants also completed Watson, Clark, and Tellegen's (1988) Positive and Negative Affect Schedule (PANAS) Positive Affect scale. Respondents were asked the degree to which they have experienced each of the 10 emotions over the past month ($\alpha = .87$). In addition, participants separately rated the frequency and intensity with which they experienced four additional positive mood adjectives (affection, joy, contentment, and pride; $\alpha = .76$ and .71, respectively). Scale scores for each of the three pleasant affect measures (PANAS, frequency, and intensity) were computed by summing all responses for each scale.

Analytic procedures. We examined the structure of the data using AMOS structural equation modeling software (Arbuckle, 1999). Because a model that included each item as an indicator of the latent facets would be too complex, we summed sets of items to create three indicators for each latent facet. We first rank ordered the item–total correlations of each of the items in each of the subscales. We then summed sets of items to get three relatively equivalent indicators (see Appendix for groups of items and standardized regression coefficients from the models). The three measures of pleasant affect (frequency of pleasant affect, intensity of pleasant affect, and the PANAS Positive Affect scale) were used as indicators of pleasant affect. Thus, we had five latent traits, with three indicators each. See Table 4 for correlations, means, and standard deviations for all variables.

Because of the large sample size ($n = 404$), the chi-square statistic may be too sensitive a measure of goodness of fit. Therefore, we follow Little's (1997) advice and evaluated the model using the ratio of the chi-square to the degrees of freedom (which is also sensitive to sample size), the root-mean-square error of approximation (RMSEA), the nonnormed fit index (NNFI), and the incremental fit index (IFI). Although there are no hard-and-fast rules for determining the appropriateness of a model, we use the rules of thumb that a model fits well if the NNFI and IFI exceed .90, the RMSEA does not exceed .05, and the ratio of chi-square to degrees of freedom remains close to 2 (Little, 1997). When two competing models exhibit similar fit indexes, we will choose the more parsimonious of the two.

Table 2
Correlations Among Extraversion Scales

Scale	1	2	3	4
1. Extraversion	**.84**			
2. NEO-PI-R	.58	**.91**		
3. MPQ	.55	.59	**.86**	
4. EPQ	.57	.63	.71	**.83**

Note. $n = 121$. All correlations are significant at $p < .001$. Cronbach's alpha coefficients for each scale are presented in boldface along the diagonal. NEO-PI-R = Revised NEO Personality Inventory; MPQ = Multidimensional Personality Questionnaire; EPQ = Eysenck Personality Questionnaire.

Table 3
Correlations Among Extraversion Facets and NEO-PI-R Facets

	Affiliation			Ascendance			Venturesome			Social Interaction		
NEO-PI-R facet	Validation study	Study 3	Study 4	Validation study	Study 3	Study 4	Validation study	Study 3	Study 4	Validation study	Study 3	Study 4
Warmth	**.54**	**.82**	**.56**	.24	.29	.41	.27	.22	.33	.07	.03	.20
Assertiveness	.19	.39	.29	**.55**	**.75**	**.77**	.18	.25	.31	.18	.04	.09
Excitement seeking	.23	.28	.28	.17	.22	.20	**.53**	**.55**	**.66**	.20	.28	.35
Gregariousness	.27	.42	.37	.10	.24	.23	.54	.73	.64	**.49**	**.49**	**.61**
Activity	.21	.45	.25	.17	.46	.32	.13	.20	.04	.07	−.11	−.11
Positive emotions	.45	.64	.57	.19	.32	.30	.11	.21	.27	−.05	.05	.06

Note. Validation study, $n = 121$; Study 3, $n = 134$; Study 4, $n = 131$. Goldberg's (1999) International Item Pool scales were used in Study 4. NEO-PI-R = Revised NEO Personality Inventory. Correlations in boldface are those that were expected to be high, given the intended content of the scales.

To make sure that the model was sound at the measurement level, we first tested whether a simple measurement model fit the data. This measurement model included each of the five latent traits (affiliation, ascendance, venturesome, social interaction, and pleasant affect) with the three indicators loading on only one latent trait. All latent traits were allowed to correlate with every other latent trait. The measurement model fit the data well, $\chi^2(80, N = 404) = 161.21$, $p < .001$. $\chi^2/df = 2.02$, NNFI = .96, IFI = .97, RMSEA = .05. Thus, we can test the competing structural models.

Results

If sociability links facets of extraversion to form the broad trait, we would expect all social facets to load strongly on a single extraversion factor. This factor should then be moderately strongly related to pleasant affect. Alternatively, if it is sensitivity to rewards that links the facets of extraversion, only scales that reflect sensitivity to rewards should load strongly. Our Social Interaction Scale should not load on the extraversion factor. Furthermore, we would expect the relation between this social interaction facet and pleasant affect to be low, and the correlation between extraversion and the pleasant affect trait to be high. To test the first hypothesis, we constructed a model in which all four latent extraversion facets load on a single second order factor (see the first model in Figure 1). We estimated the parameters of this model, focusing on the paths from this factor to each facet and the correlation between the trait of extraversion and pleasant affect.

The fit indexes for this model were acceptable, $\chi^2(85, N = 404) = 228.74$, $p < .001$, $\chi^2/df = 2.69$, NNFI = .94, IFI = .95, RMSEA = .07. Yet, examination of the estimated parameters revealed that the standardized loading of social interaction on extraversion was only .03. This value is not significantly different from 0 (critical ratio = .52, *ns*). Even though the Social Interaction Scale is clearly social in nature, correlating moderately with Gregariousness and actual social activity, it shared no variance with the variance that is common to the other three facets. Thus, it appears that the common variance does not reflect the shared social content of these scales.

According to our second hypothesis, only the three traditional traits of affiliation, ascendance, and venturesome should load on

Table 4
Correlations, Means, and Standard Deviations for U.S. Sample (Studies 1, 2a, 2b)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. PANAS	—														
2. FREQPA	.65	—													
3. IPA	.52	0.66	—												
4. SI1	−.09	−.09	−.12	—											
5. SI2	.02	.02	−.02	.55	—										
6. SI3	−.05	−.09	−.11	.57	.69	—									
7. VEN1	−.00	−.00	−.01	.17	.28	.17	—								
8. VEN2	.09	.06	.10	.21	.24	.15	.40	—							
9. VEN3	.09	.08	.07	.20	.31	.21	.50	.64	—						
10. ASC1	.33	.31	.32	.02	.12	.04	.21	.23	.22	—					
11. ASC2	.45	.44	.43	−.02	.13	.06	.16	.23	.20	.66	—				
12. ASC3	.38	.35	.34	.01	.11	.01	.29	.24	.23	.66	.65	—			
13. AFF1	.40	.41	.40	−.05	.07	−.03	−.02	.06	.04	.34	.30	.32	—		
14. AFF2	.31	.35	.31	.04	.10	.03	−.01	.08	.02	.27	.22	.29	.66	—	
15. AFF3	.46	.46	.44	−.09	.10	.02	.06	.13	.11	.36	.39	.42	.74	.66	—
M	0.23	0.98	0.94	−0.87	0.31	−0.54	0.78	0.80	0.67	0.43	0.66	0.79	0.88	0.48	0.79
SD	6.92	4.43	4.00	3.30	3.25	2.61	2.77	2.40	2.42	2.46	2.67	2.42	3.41	2.71	3.87

Note. $N = 404$. PANAS = Positive and Negative Affect Schedule; FREQPA = frequency of pleasant affect; IPA = intensity of pleasant affect; SI1–SI3 = Social Interaction indicators; VEN1–VEN3 = Venturesome indicators; ASC1–ASC3 = Ascendance indicators; AFF1–AFF3 = Affiliation indicators. All variables are deviated from grand mean of the combined U.S. and international samples from Study 2 (see Footnote 2).

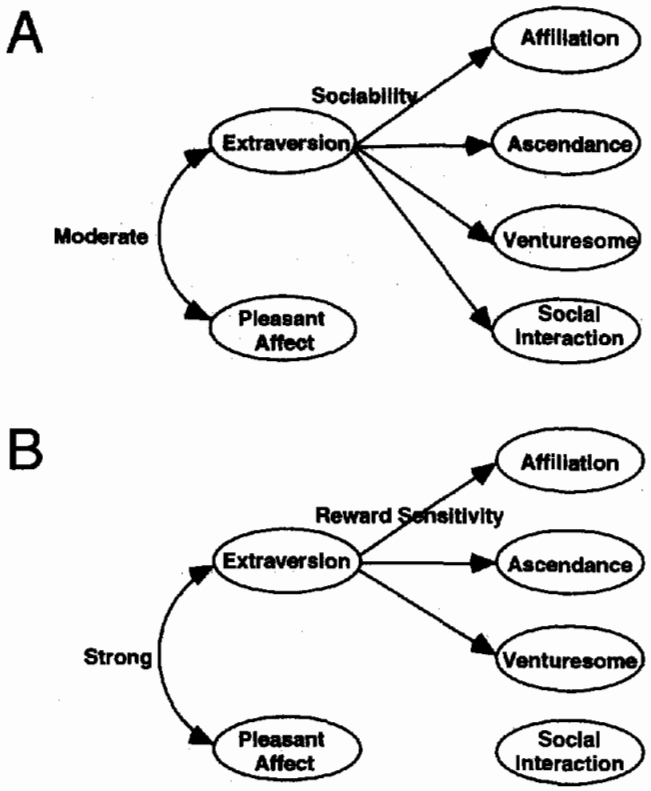

Figure 1. Diagram of competing structural models. Panel A = Hypothesis: Sociability links facets. Panel B = Our prediction: Sensitivity to rewards links facets. Measurement model not shown. All latent traits (except the higher order extraversion factor) bave three indicators each.

the second order trait of extraversion (see the second model in Figure 1). Social interaction may share some variance with each of the other facets (as each could represent sociability to some extent) and was therefore allowed to correlate with the unique variance associated with each facet. Social interaction was also allowed to correlate with pleasant affect. This model also fit well, $\chi^2(82, N = 404) = 184.90$, $p < .001$, $\chi^2/df = 2.26$, NNFI = .95, IFI = .96, RMSEA = .06. The paths between social interaction and the unique variance of affiliation, between social interaction and the unique variance of ascendance, and between social interaction and pleasant affect were not significant (.09, .07, and -.05, respectively) and were dropped from the model with no significant effect on the chi-square or other fit statistics: final model, $\chi^2(85, N = 404) = 190.18$, $p < .001$, $\chi^2/df = 2.24$, NNFI = .95, IFI = .96, RMSEA = .06. Models representing the two hypotheses are not nested and therefore cannot be compared directly. However, the estimated parameters conformed more closely to our predictions in the second model: Social interaction did not relate to the common variance associated with each of the three extraversion facets. Furthermore, the higher order extraversion trait related strongly to pleasant affect (.82), whereas the correlation between pleasant affect and social interaction could be constrained to 0 (and was a nonsignificant -.05 when estimated).

Table 5 summarizes the parameters for the final structural model. Affiliation and ascendance loaded strongly on the higher order trait, whereas venturesome loaded weakly (though still significantly). This pattern corresponds well with Cunningham's (1988a, 1988b) findings on the effects of elation on social behavior. In his research, elation elicits feelings of warmth, self-confidence, and desire for exciting leisure activities. The fact that affiliation and ascendance were more strongly related to the second order factor is also in line with Watson and Clark's (1997) contention that venturesome is not central to the trait of extraversion.

Study 2

In Study 2 we test the generalizability of the structure found in Study 1 to an international sample. More specifically, we will test two separate questions regarding the generalizability: (a) Is the structure unique to the United States or can it be identified in an international sample? (b) Does this structure apply equally well to individualistic countries and collectivistic countries?

Method

Participants. The analyses reported in Study 2 are based on 6,469 college students from 39 countries (2,468 men; 3,923 women; 78 not reporting gender). Eighty-three percent of the participants were 18 to 25 years old. Only the 5,842 participants with complete data were included in the structural equation modeling analyses (see Table 6 for sample sizes from each nation).

Measures. All measures included in Study 1 were administered to participants in Study 2 (reliabilities for extraversion facets are reported in Table 2; reliability of PANAS = .82; reliability of frequency of pleasant affect = .72; reliability of intensity of pleasant affect = .74). Scales were administered by colleagues in universities from each of the nations listed in Table 6. Although it is ideal to conduct a back translation for each of the languages used, because of the large number of nations involved in our study, only the Chinese, Japanese, Korean, and Spanish language versions went through this process, and these versions were used in many countries that spoke these languages. The back translations of the questionnaire from these languages was excellent (for more information, see Shao, 1997). Furthermore, the applied means and covariance structure analysis technique that we use is sensitive to irregularities in translations, and it is unlikely that our models would fit if these differences were substantial.

Analyses. The correlation matrix, means, and standard deviations for the international sample are presented in Table 7. To test the generalizability of the structure obtained in Study 1 to the international data, we use the means and covariance structure analysis approach (MACS) to examining cross-cultural data (for a detailed description of this method, see Little, 1997). This extension of standard structural equation modeling

Table 5
Estimated Parameters for Final Models in Studies 1 and 2

Model	Study 1	Study 2a	Study 2b
Standardized regression weights			
Affiliation	.72	.73	.72
Ascendance	.71	.60	.72
Venturesome	.22	.33	.30
Social Interaction[a]	.00	.00	.00
Correlations			
Pleasant affect and extraversion	.82	.80[b]/.71[c]	.77[d]/.59[e]
Pleasant affect and Social Interaction[a]	.00	.00	.00
Social Interaction and Venturesome	.37	.31	.29

[a] These parameters are constrained to 0. [b] Estimated parameter in the U.S. sample. [c] Estimated parameter in the International sample. [d] Estimated parameter in the U.S. and Individualist sample. [e] Estimated parameter in the Collectivist sample.

Table 6
Nations Included in Study 2

Nation	*n*	I–C rating
Argentina	90 (78)	4.80
Australia	292 (283)	9.00
Austria	164 (151)	6.75
Bahrain	124 (104)	3.00
Brazil	112 (108)	3.90
China	558 (433)	2.00
Colombia	100 (100)	2.15
Denmark	91 (83)	7.70
Egypt	120 (95)	4.40
Estonia	119 (113)	4.00
Finland	91 (85)	7.15
Germany	108 (95)	7.35
Ghana	118 (102)	3.00
Greece	129 (118)	5.25
Guam	186 (98)	5.00
Hong Kong	142 (136)	4.75
Hungary	74 (70)	6.00
India	93 (89)	4.00
Indonesia	90 (89)	2.20
Italy	289 (275)	6.80
Japan	200 (195)	4.30
Korea	277 (272)	2.40
Lithuania	101 (100)	4.00
Nepal	99 (81)	3.00
Nigeria	244 (216)	3.00
Norway	99 (96)	6.95
Pakistan	155 (141)	2.20
Peru	129 (117)	2.80
Portugal	139 (132)	3.85
Puerto Rico	87 (82)	7.00
Singapore	131 (128)	3.50
Slovenia	50 (49)	5.00
South Africa	373 (342)	5.75
Spain	327 (293)	5.55
Taiwan	533 (509)	3.85
Tanzania	134 (105)	3.00
Thailand	92 (87)	3.00
Turkey	100 (91)	3.85
Zimbabwe	109 (102)	3.00
Total	6,469 (5,842)	4.49[a]

Note. *n* in parentheses equals number of respondents with no missing items. These individuals were used in structural equation modeling analyses. I–C rating = individualism–collectivism rating.
[a] Mean I–C rating for all respondents.

analyzes mean-level information in addition to variance–covariance information. It allows us to test a series of sequentially more restrictive hypotheses about the invariance of the model developed in the United States. In the first step, we specify the identical structure across groups, yet we allow the parameters for each group to be estimated freely. If this model fits, we can then make more restrictive assumptions about the invariance of the structure across groups. The loadings of each indicator are first constrained and the fit of this more restrictive model is evaluated. Next, the intercept or mean of each indicator is constrained. Finally, we test whether the variances and second order factor loadings can be constrained to equality across groups (latent means and intercepts are constrained to 0 throughout the analyses).

As Little (1997) points out, model testing can proceed using two approaches: a statistical approach and a modeling approach. In the former, the chi-square is calculated for each model, and nested models can be compared by subtracting the chi-square of the more restrictive model from the freely estimated model. This value can then be compared to a chi-square distribution with degrees of freedom equal to the difference between the degrees of freedom for each model. If this difference in chi-square is significant, the more restrictive model is significantly worse than the freely estimated model. However, the chi-square may be an overly sensitive measure when multiple constraints are made, particularly with large sample sizes. For this reason, we proceed using a modeling approach to model testing. According to this approach, a more parsimonious model can be said to approximate the data if the additional constraints lead to little change in fit statistics. Although there is no hard-and-fast rule for interpreting change in fit statistics, Little suggests that when the NNFI and IFI decrease by less than .05, the information gained by relaxing the constraints is trivial.[2] We use these rules of thumb as a starting point in our evaluations of model fit. Furthermore, when constraining a single parameter across samples (e.g., when we compare the correlation between pleasant affect and extraversion), we use a statistical rationale and rely on the significance of the change in chi-square.

Results

Study 2a: Uniqueness. To test the question of uniqueness, we compared the structure found in Study 1 with data from the entire international sample. We should point out that the international sample is more than 10 times the size of the U.S. sample. Because the chi-square statistic is influenced by sample size, the chi-square (and the ratio of chi-square to degrees of freedom) will be much larger in Study 2 than in Study 1.

In the first stage of model testing, we specified the same structure in both samples. We allowed all parameters to be estimated freely in each sample. The model fit the data well (see Table 8). Thus, we tested whether the parameters could be constrained across samples. In the first step, the factor loadings in the measurement model were constrained. The model did not suffer from this constraint: The fit indexes were almost identical. In the next step of our analyses, the means of the indicators were constrained to equality across groups. This model also fit the data well. We gain little information by freely estimating parameters of the measurement model in each group. Thus, we tested the invariance of the structural model.

To test the generalizability of the structural model, variances and loadings of the latent factors were constrained to equality across groups. Because the correlation between extraversion and pleasant affect was of particular importance, we examined this constraint separately. When we constrained the variances and loadings of all latent variables, the model still fit well. Constraining the correlation between extraversion and pleasant affect to equality resulted in little substantial change in fit indexes. However, the change in chi-square was significant, $\Delta\chi^2(1, N = 6{,}246) = 4.66, p < .05$, showing that the correlation was significantly lower in the international sample ($r = .71$) than it was in the U.S. sample ($r = .80$). The fit indexes for the various steps are summarized in Table 8.

[2] The NNFI and IFI are relative indexes that compare the fit of the specified model with the fit of a baseline model. The default baseline model is an independence model with all means equal to 0. This baseline model seems inappropriate for our data, as it is unreasonable to assume that the means for scores that range from 1 to 7 would ever be 0. Thus, when calculating the NNFI and IFI, we use an independence model, with indicator means equal to the grand mean (across all participants) as a baseline model (this is accomplished by centering all scores around the grand mean). The use of this baseline model provides more conservative fit indexes than a baseline model in which means are set to 0.

Table 7
Correlations, Means, and Standard Deviations for International Sample (Study 2a)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. PANAS	—														
2. FREQPA	.57	—													
3. IPA	.47	.66	—												
4. SI1	−.04	.00	−.02	—											
5. SI2	−.05	.02	−.02	.50	—										
6. SI3	.01	.04	−.01	.54	.57	—									
7. VEN1	.08	.10	.11	.10	.23	.11	—								
8. VEN2	.06	.06	.08	.17	.19	.14	.27	—							
9. VEN3	.09	.12	.15	.13	.20	.11	.38	.50	—						
10. ASC1	.25	.20	.20	−.02	.02	.04	.11	.12	.16	—					
11. ASC2	.32	.27	.19	−.07	−.03	.01	.08	.10	.08	.53	—				
12. ASC3	.33	.26	.22	−.02	.02	.04	.09	.12	.14	.53	.55	—			
13. AFF1	.22	.24	.28	.05	.06	.02	.05	.16	.14	.22	.17	.19	—		
14. AFF2	.25	.32	.37	.05	.07	.03	.06	.17	.17	.19	.11	.17	.55	—	
15. AFF3	.34	.34	.34	−.01	.03	.02	.11	.16	.16	.27	.27	.31	.56	.52	—
M	−0.01	−0.06	−0.06	0.06	−0.02	0.04	−0.05	−0.05	−0.05	−0.03	−0.05	−0.06	−0.06	−0.03	−0.05
SD	6.94	4.23	4.09	3.51	3.00	2.63	2.53	2.42	2.46	2.50	2.62	2.35	3.31	2.87	3.65

Note. N = 5,842. PANAS = Positive and Negative Affect Schedule; FREQPA = frequency of pleasant affect; IPA = intensity of pleasant affect; SI1–SI3 = Social Interaction indicators; VEN1–VEN3 = Venturesome indicators; ASC1–ASC3 = Ascendance indicators; AFF1–AFF3 = Affiliation indicators. All variables are deviated from grand mean of the combined U.S. and international samples from Study 2 (see Footnote 2).

The parameters for the simultaneously estimated model are summarized in Table 5. These parameters are similar to those for the model estimated using data from the United States only. Again, we identified a higher order factor that linked the facets of extraversion. This factor was strongly related to pleasant affect, and only those factors that reflect sensitivity to reward loaded on the higher order factor. Social interaction was not related to the extraversion factor or to pleasant affect (in fact, once we established the model in both samples, we freed the path between social interaction and extraversion, and this path was again nonsignificant). Thus, the model developed in Study 1 is not unique to the United States—we can generalize the structure to our sample of individuals from 39 nations.

Study 2b: Individualist cultures versus collectivist cultures. The test of uniqueness is only the first step in understanding the influence of culture on the relations among extraversion facets and pleasant affect. By including participants from each of the 39 nations, we effectively eliminated the effect of culture. Although this is an important step—it shows that the structure is not unique to the United States—it does not address specifically how these relations are affected by culture. To answer this question, we compared the data from a group of participants from individualist countries and a group of participants from collectivist countries with the data from our U.S. sample. Correlation matrices, means, and standard deviations from the individualist and collectivist samples are presented in Tables 9 and 10.

Table 8
Fit Indexes for the Test of Uniqueness in Study 2a

Model	χ^2	*df*	χ^2/df	NNFI	IFI	RMSEA
All parameters free	1,624.58	170	9.56	.94	.95	.04
Loadings constrained	1,655.14	180	9.20	.94	.95	.04
Means constrained	1,870.88	195	9.59	.93	.94	.04
Structural model constrained	1,929.46	204	9.46	.93	.94	.04
Correlation between extraversion and pleasant affect constrained	1,934.12	205	9.44	.93	.94	.04

Note. N = 6,246. All constraints are maintained in subsequent models. The change in chi-square when the correlation between extraversion and pleasant affect is constrained is 4.66 ($df = 1, p < .05$). NNFI = nonnormed fit index; IFI = incremental fit index; RMSEA = root-mean-square error of approximation.

Nations were rated on the dimension of individualism–collectivism by two leading experts in the field: Geert Hofstede (1980) and Harry Triandis (Suh et al., 1998). Triandis rated the relative degree of individualism–collectivism using a scale that ranged from 1 (*most collectivistic*) to 10 (*most individualistic*). Hofstede's ratings were converted to a 10-point scale and averaged with Triandis' ratings. The interrater correlation among the 26 overlapping nations was .78 ($p < .001$). Ratings for each nation are listed in Table 6. For the purposes of these analyses, nations with ratings of 3 or less were categorized as collectivistic and nations with ratings of 6 or above were categorized as individualistic (these cutoff points were determined to provide groups of approximately equal size, while keeping the groups as extreme as possible). Once we determined the groups of individualistic and collectivistic nations, we randomly sampled 404 individuals from each group to include in our analyses.

As can be seen in Table 11, a model that allows all parameters to be estimated freely fit the data well. Furthermore, constraining the loadings of indicators resulted in minimal changes in goodness-of-fit indexes. But when means were constrained to equality across groups, goodness-of-fit indexes suggest that there is a significant drop in fit. Thus, we could not constrain the means to be equal across groups. We did, however, test a series of models that constrained the various pairs of groups' means to equality. Only a model in which the means in the U.S. sample and the means in the individualistic sample were equal fit the data. This is not

Table 9
Correlations, Means, and Standard Deviations for Individualist Sample (Study 2b)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. PANAS	—														
2. FREQPA	.49	—													
3. IPA	.38	.59	—												
4. SI1	−.03	.05	.03	—											
5. SI2	−.03	.05	.00	.47	—										
6. SI3	−.04	.03	−.01	.56	.63	—									
7. VEN1	.09	.09	.11	.06	.22	.12	—								
8. VEN2	.07	.20	.08	.01	.19	.15	.38	—							
9. VEN3	−.01	.05	.10	.05	.20	.12	.43	.51	—						
10. ASC1	.32	.21	.20	−.07	.03	.01	.14	.12	.16	—					
11. ASC2	.45	.40	.31	−.08	.03	−.00	.16	.12	.08	.59	—				
12. ASC3	.32	.29	.28	−.03	.07	.03	.19	.16	.19	.58	.58	—			
13. AFF1	.27	.20	.21	−.07	.02	−.04	.15	.10	.16	.21	.30	.26	—		
14. AFF2	.27	.22	.30	.02	.04	.03	.15	.21	.18	.19	.21	.18	.51	—	
15. AFF3	.37	.31	.32	−.04	.09	.05	.24	.20	.23	.29	.37	.36	.58	.54	—
M	0.15	0.30	1.35	−0.44	−0.41	−0.28	0.21	0.19	0.17	−0.25	−0.31	0.02	0.56	1.06	0.75
SD	6.25	3.81	3.67	3.31	2.85	2.57	2.53	2.34	2.41	2.55	2.71	2.24	3.06	2.48	3.58

Note. $N = 404$. PANAS = Positive and Negative Affect Schedule; FREQPA = frequency of pleasant affect; IPA = intensity of pleasant affect; SI1–SI3 = Social Interaction indicators; VEN1–VEN3 = Venturesome indicators; ASC1–ASC3 = Ascendance indicators; AFF1–AFF3 = Affiliation indicators. All variables are deviated from grand mean of the combined U.S. and international samples from Study 2 (see Footnote 2).

surprising given that others have found mean differences in measures of subjective well-being and personality (Shao, 1993; for a review of cross-cultural approaches to personality, see Church & Lonner, 1998). The fact that we have found partial measurement invariance across our groups (i.e., the indicators load on the factors in the same way in each sample) allows us to be confident in these differences.

Because the main focus is on structural differences in extraversion, tests of the structural model proceeded with the means constrained in the U.S. and individualistic samples. We next tested whether the variances and second order factor loadings could be constrained to equality across the three groups. This model fit the data, illustrating that the facets of extraversion and pleasant affect showed similar interrelations across samples from different cultures. Our final test was to examine whether the additional constraint of equality in the correlation between extraversion and pleasant affect leads to a significantly worse fit. The change in chi-square when this constraint is made was significant, $\Delta\chi^2(2, N = 1{,}242) = 8.43$, $p < .05$. Thus, the correlation was not the same across samples. The correlation could be constrained to equality in the U.S. and individualist samples, $\Delta\chi^2(1, N = 1{,}242) = 0.07$, *ns*. The estimated correlations in the U.S., individualist, and the collectivist samples were .77, .77, and .59, respectively (see Table 5). Thus, the

Table 10
Correlations, Means, and Standard Deviations for Collectivist Sample (Study 2b)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. PANAS	—														
2. FREQPA	.62	—													
3. IPA	.53	.74	—												
4. SI1	−.00	.06	.08	—											
5. SI2	−.02	.08	.09	.42	—										
6. SI3	.10	.18	.12	.49	.45	—									
7. VEN1	−.01	−.00	.03	.01	.09	−.07	—								
8. VEN2	.08	.07	.07	.18	.15	.10	.19	—							
9. VEN3	.13	.18	.16	.08	.20	.05	.20	.41	—						
10. ASC1	.22	.20	.20	.05	.06	.09	.07	.06	.16	—					
11. ASC2	.26	.21	.20	−.07	−.03	−.03	.04	.14	.13	.33	—				
12. ASC3	.31	.23	.25	.07	.04	.11	.06	.07	.15	.43	.45	—			
13. AFF1	.23	.19	.24	.10	.02	.06	−.11	.15	.10	.33	.16	.26	—		
14. AFF2	.32	.38	.40	.13	.09	.10	−.11	.15	.19	.24	.13	.25	.49	—	
15. AFF3	.27	.29	.32	.01	.06	.11	−.06	.14	.13	.25	.30	.30	.55	.52	—
M	−0.09	−0.57	−1.25	0.45	0.19	0.38	−0.53	−0.32	−0.57	0.32	0.89	0.23	−0.94	−1.19	−0.58
SD	7.58	4.82	4.56	3.49	2.95	2.63	2.60	2.41	2.33	2.44	2.30	2.51	3.62	3.06	3.68

Note. $N = 404$. PANAS = Positive and Negative Affect Schedule; FREQPA = frequency of pleasant affect; IPA = intensity of pleasant affect; SI1–SI3 = Social Interaction indicators; VEN1–VEN3 = Venturesome indicators; ASC1–ASC3 = Ascendance indicators; AFF1–AFF3 = Affiliation indicators. All variables are deviated from the grand mean of the combined U.S. and international samples from Study 2 (see Footnote 2).

Table 11
Fit Indexes for the Comparison of Individualistic and Collectivistic Samples in Study 2

Model	χ^2	*df*	χ^2/df	NNFI	IFI	RMSEA
All parameters free	556.56	255	2.18	.94	.95	.03
Loadings constrained	609.78	275	2.22	.94	.95	.03
Means constrained	1,109.63	305	3.64	.87	.89	.05
Means in U.S. and individualistic sample constrained	745.07	290	2.57	.92	.94	.04
Structural model constrained	845.26	308	2.74	.91	.92	.04
Correlation between extraversion and pleasant affect constrained in all samples	853.69	310	2.75	.91	.92	.04
Correlation between extraversion and pleasant affect constrained in U.S. and individualistic sample	845.33	309	2.74	.91	.92	.04

Note. $N = 1,242$. All constraints are maintained in subsequent models with the exception of the means of the indicators. Only means in the U.S. sample and the individualistic sample are constrained to equality in tests of the structural model. The change in chi-square when the correlation between extraversion and pleasant affect is constrained in all samples is 8.43 ($df = 2$, $p < .05$). The change in chi-square when this correlation is constrained in the U.S. and the individualistic sample is .07 ($df = 1$, *ns*). NNFI = nonnormed fit index; IFI = incremental fit index; RMSEA = root-mean-square error of approximation.

same factor structure emerges across cultures, but as predicted, the correlation between extraversion and pleasant affect was weaker in collectivist nations.

Study 3

One alternative explanation of the results from Studies 1 and 2 is that reward sensitivity does form the core of the extraversion facets measured in the new Extraversion Scale, but that the facets of the new scale are conceptually or psychometrically different from similar scales in existing extraversion inventories. To address this possibility, we conducted Study 3. First, we conducted an exact replication of Studies 1 and 2 using the same Extraversion Scale in a different sample. Then, we attempted to fit the same structural model using similar facet scales from the NEO-PI-R Extraversion scale (Costa & McCrae, 1992). If the model fits using these established facet scales (and the estimated parameters are similar), we can rule out the possibility that the results are due solely to idiosyncrasies of the new Extraversion Scale.

Method

Participants. Participants were 158 students from a semester-long course on subjective well-being. Students learned about personality and subjective well-being during lectures and provided data during lab sections. Of the 158 students, 134 completed all scales and only these participants are included in the analyses.

Measures. Participants completed the new 31-item Extraversion Scale. In addition, they completed the entire NEO-PI-R (Costa & McCrae, 1992). Participants also completed 20-item PANAS Affect scales (Watson, Clark, & Tellegen, 1988) three times throughout the semester.

Analytic procedure. A simplified version of the model from Studies 1 and 2 was tested (complex models require many participants; because we only had 134 participants, we tested a model with as few parameters as possible). Instead of modeling latent facets, the affiliation, ascendance, and venturesome facet scores from the new Extraversion Scale were allowed to load on a single extraversion factor. In addition, the three measures of positive affect loaded on a single latent factor. The correlation between extraversion and pleasant affect and the correlations between the Social Interaction Scale and the residnal term for the Venturesome scale were estimated. The correlations between social interaction and extraversion and between social interaction and pleasant affect were constrained to 0. We evaluated this model using the same fit indexes used in Study 1, though in Study 3 we also rely on the significance of the chi-square statistic because the sample size is not overly large.

Once we tested the model using the new Extraversion facet scales (Study 3a), we substituted similar facet scales from the NEO-PI-R (namely warmth for affiliation, assertiveness for ascendance, and excitement seeking for venturesome) and tested the model again (Study 3b). Correlations, means, and standard deviations for all variables are presented in Table 12.

Results

Fit indexes for both models are presented in Table 13. When both the new facets and the NEO-PI-R facets were tested, the model fit well. The chi-square statistics were nonsignificant, the NNFI and IFI were close to 1.00, and the RMSEA was less than or equal to .05. Estimated parameters for both models are presented in Table 14. All three extraversion facets were significantly associated with the higher order trait, and again, affiliation (warmth) and ascendance (assertiveness) loaded more strongly than venturesome (excitement seeking). The correlation between the higher order trait and pleasant affect was almost identical when the NEO-PI-R extraversion facets or the new facets were used (.66 vs. .62, respectively). Thus, the results obtained in Studies 1 and 2 are not due to the idiosyncrasies of the new Extraversion Scale. Instead, the model was replicated when established extraversion facet scales were used (though the correlation between extraversion and pleasant affect was lower in this sample than in Studies 1 and 2, perhaps because of the different affect measures used in the different studies).

Study 4

Although Study 3 addressed concerns about the affiliation, ascendance, and venturesome facets, there are still potential alternative explanations having to do with the new Social Interaction Scale created for this study. First, most of the social interaction items are reverse scored. Thus, this scale may exhibit a different pattern of relations than other scales simply because of the wording of the items. In addition, most of the items describe enjoyment of nonsocial situations. One could argue that these items pit two related sources of variance against one another: reward sensitivity (a general tendency to enjoy things) and sociability. The resulting scale may not correlate with a higher order extraversion trait

Table 12
Correlation Matrixes, Means, and Standard Deviations for Study 3

New Extraversion facets	1	2	3	4	5	6	7
1. Social Interaction	—						
2. Venturesome	.54	—					
3. Ascendance	.10	.14	—				
4. Affiliation	.03	.22	.44	—			
5. T3PA	.09	.22	.28	.27	—		
6. T2PA	.04	.15	.37	.43	.72	—	
7. T1PA	−.03	.03	.36	.44	.55	.75	—
M	24.98	25.61	29.18	62.70	32.38	33.12	33.89
SD	7.20	6.89	5.95	7.13	7.72	7.85	7.08
NEO-PI-R Extraversion facets	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. Social Interaction	—						
2. Excitement seeking	.32	—					
3. Assertiveness	.08	.20	—				
4. Warmth	.09	.38	.29	—			
5. T3PA	.09	.26	.36	.24	—		
6. T2PA	.04	.23	.39	.38	.72	—	
7. T1PA	−.03	.20	.36	.33	.55	.75	—
M	24.98	24.94	17.87	27.23	32.38	33.12	33.89
SD	7.20	4.31	5.27	4.47	7.72	7.85	7.08

Note. N = 134. T1PA–T3PA = Time 1, Time 2, and Time 3 pleasant affect; NEO-PI-R = Revised NEO Personality Inventory.

because the scale contrasts two sources of variance that are usually linked in the higher order trait.

We believe that the pattern of validity coefficients presented above argue against this possibility. The Social Interaction Scale consistently correlates with other indicators of sociability (including Gregariousness scales and indexes of actual social behavior), yet it never correlates negatively with pleasant (or unpleasant) affect. However, to address the possibility, we created nine new social interaction items that are not subject to these criticisms. These items (listed in the Appendix) are almost entirely positively keyed and do not explicitly mention enjoyment of nonsocial situations. Instead, these items assess preference for spending time with others versus spending time alone (e.g., "You rarely prefer spending time alone to spending time with others" and "You always prefer being with others to spending time alone"), the amount of time spent alone (e.g., "You rarely spend time alone"), or comparisons of enjoyment of social situations to enjoyment of nonsocial situations ("You always enjoy yourself more when you are with other people than when you are alone"). According to our hypotheses, this scale should show a similar pattern of correlations with pleasant affect and extraversion facets; and the addition of these items should not influence the fit of the models developed in Studies 1 through 3.

Table 13
Fit Indexes for Models in Studies 3 and 4

Study	N	χ^2	df	χ^2/df	NNFI	IFI	RMSEA
Study 3a	134	16.35	13	1.26	.98	.99	.04
Study 3b	134	15.54	13	1.20	.99	.99	.04
Study 4a	131	4.99	5	1.00	1.00	1.00	.00
Study 4b	131	7.94	5	1.59	.95	.98	.07

Note. All chi-square statistics are nonsignificant. NNFI = nonnormed fit index; IFI = incremental fit index; RMSEA = root-mean-square error of approximation.

Method

Participants. A scale-validation sample of 68 undergraduate students was recruited from an introductory psychology class in return for course credit. A separate sample of 142 upper-level students enrolled in a semester-long course on subjective well-being was recruited to test the structural models. Similar to participants in Study 3, these students learned about personality and subjective well-being in weekly lectures and participated in research projects during lab sections. One hundred thirty-one of these participants completed all scales, and these participants are included in the structural equation analyses.

Table 14
Estimated Parameters for Final Models in Studies 3 and 4

Model	Study 3a	Study 3b	Study 4a	Study 4b
Standardized regression weights				
Affiliation	.74	.62	.58	.74
Ascendance	.59	.52	.58	.74
Venturesome	.23	.44	.31	.40
Social Interaction[a]	.00	.00	.00	.00
Correlations				
Pleasant affect and extraversion	.62	.66	.67	.62
Pleasant affect and Social Interaction[a]	.00	.00	.00	.00
Social Interaction and Venturesome	.55	.33	.61	.34

[a] These parameters are constrained to 0.

Measures. Participants in the validation phase completed the original 8-item Social Interaction Scale, the 9 new social interaction items, the PANAS Positive Affect scale, and Goldberg's (1999) International Personality Item Pool (IPIP) Extraversion scale. This scale consists of six extraversion facet scales that measure constructs similar to the facets of the NEO-PI-R Extraversion scale. The scales are very reliable and show a strong pattern of convergent validity (see Goldberg, 1999, for more details). Participants in the structural equation modeling phase completed the 17-item Social Interaction Scale, the PANAS Positive Affect scale, and the IPIP Extraversion scale.

Analytic procedure. Participants in the validation phase completed all scales in a single session. Scale scores were constructed for the original Social Interaction Scale, the new Social Interaction Scale, and a composite Social Interaction Scale consisting of all 17 items. These Social Interaction Scale scores were then correlated with the six extraversion facets and positive affect. The old and new Social Interaction Scale scores correlated .62. When corrected for the unreliability of the scales (the old scale exhibited an unusually low alpha of .61 and the new scale had a reliability of .71; see Table 1 for previous reliability information), this correlation rose to .94. The reliable variance of the old and new scales was virtually indistinguishable. Correlations for the old, new, and composite scale are presented in Table 15. The pattern of correlations was almost identical for all three versions of the Social Interaction Scale. Social interaction was moderately and significantly related to gregariousness, and the new Social Interaction Scale was significantly related to excitement seeking (the old scale is often related to excitement seeking; see Table 3). Thus, the new scale was almost indistinguishable from the old scale, even though the new scale is almost entirely positively keyed and does not explicitly refer to enjoyment of nonsocial situations.

On the basis of these results, we tested 2 models similar to those tested in Study 3, substituting the new 17-item composite Social Interaction Scale for the old 8-item scale. First, we replicated Studies 1 and 2 using the affiliation, ascendance, and venturesome facets as indicators of a higher order extraversion trait (Study 4a). This latent trait was allowed to correlate with the PANAS Positive Affect scale score. The correlation between the composite Social Interaction Scale and the higher order extraversion trait, and the correlation between social interaction and PANAS Positive Affect were constrained to 0. The path between social interaction and the residual term for the Venturesome scale was estimated. We then substituted similar facet scores from the IPIP scales (Friendliness, Assertiveness, and Excitement seeking) for the Affiliation, Ascendance, and Venturesome scales to replicate Study 3 (Study 4b). Correlations, means, and standard deviations are presented in Table 16.

Results

Fit indexes for both models are presented in Table 13. When both the new facets and the IPIP facets were tested, the model fit well. The chi-square statistics were nonsignificant, the NNFI and IFI were close to 1.00, and the RMSEA was less than or close to .05.

Table 15
Correlations Between Social Interaction and Extraversion and Pleasant Affect

	Social Interaction Scale		
Facet	Old	New	Composite
Warmth	.20	.12	.17
Gregariousness	.38**	.45**	.46**
Assertiveness	−.04	.07	.03
Activity	−.16	.05	−.05
Excitement seeking	.06	.31*	.21
Positive emotions	−.17	.06	−.05
Pleasant affect	−.18	.05	−.06

Note. $n = 67$.
* $p < .05$. ** $p < .01$.

Estimated parameters for both models are presented in Table 14. All three facets were associated with the higher order trait, and again, affiliation (friendliness) and ascendance (assertiveness) loaded more strongly than venturesome (excitement seeking). The correlation between the higher order trait and pleasant affect was almost identical when either the IPIP facet scales or the new facet scales were modeled (.62 vs. .67). This provides more support that the results obtained in Studies 1 and 2 were not due to the idiosyncrasies of the new Extraversion Scale.

In addition, the model still fit even though the new Social Interaction Scale was used (in fact, the model fit and the parameters were almost identical when either the entire 17-item scale or just the 9 new items were used). Thus, the results of Studies 1 through 3 cannot be due to the keying of items in the original Social Interaction Scale or to the use of enjoyment questions as measures of social interaction. Furthermore, even when we estimated the path from the new Social Interaction Scale to the extraversion trait and to pleasant affect, they were nonsignificant. Thus, social interaction was unrelated to the variance shared by traditional extraversion facets.

General Discussion

In searching for the "fundamental features" of a higher order trait, it is necessary (a) to identify the variance that is common to all facets of the trait and (b) to develop a parsimonious theory that explains why the unique facets are linked through this common variance. In regard to extraversion, one hypothesis is that the common variance in the higher order trait represents the tendency to be sociable. Different facets may simply represent different manifestations of sociability. One could be social by expressing warmth to his or her family (affiliation), by doing exciting things with friends (venturesome), or by organizing and directing groups of people (ascendance). The advantage of identifying and labeling this common variance is that it enables personality psychologists to explain the pattern of relations in the nomological network surrounding the trait. For example, if extraversion is a stable trait that consistently correlates with pleasant affect, knowing that the variance common to all facets of extraversion can be identified and labeled as sociability would enable us to focus research efforts on understanding why sociability leads to increased pleasant affect. This is the rationale that has guided much of the research on the relation between extraversion and pleasant affect.

The accumulated body of research on the relation between extraversion and pleasant affect suggests, however, that differences in sociability cannot account for all of the differences in pleasant affect that extraverts and introverts experience. Extraverts tend to feel more pleasant affect even when they are alone. Furthermore, Cunningham (1988a, 1988b) described a mechanism through which the causal arrow could be reversed: Pleasant emotions may prompt one to approach social situations if those situations are rewarding. If social situations are, on average, more rewarding (which they tend to be), extraverts may approach these situations not because extraverts are more sociable but because they are more sensitive to the rewards inherent in most social situations. If so, then sociability may simply be a by-product of greater sensitivity to rewards, rather than the variance that holds the facets of extraversion together.

Table 16
Correlation Matrixes, Means, and Standard Deviations for Study 4

New Extraversion Facet Scales	1	2	3	4	5
1. PANAS	—				
2. Social Interaction	.01	—			
3. Venturesome	.15	.59	—		
4. Ascendance	.41	.06	.25	—	
5. Affiliation	.40	−.01	.22	.28	—
M	34.86	54.40	25.44	29.21	62.25
SD	6.15	13.22	5.95	5.72	6.72
Goldberg International Personality Item Pool Facet Scales	1	2	3	4	5
1. PANAS	—				
2. Social Interaction	.01	—			
3. Excitement seeking	.22	.35	—		
4. Assertiveness	.45	.09	.36	—	
5. Warmth	.48	.20	.33	.54	—
M	34.86	54.40	33.05	35.65	38.21
SD	6.15	13.22	7.06	6.40	6.66

Note. PANAS = Positive and Negative Affect Schedule.

We tested this hypothesis by examining the structure of the relations among different facets of extraversion and pleasant affect. We were able to identify a higher order factor linking the facets of affiliation, ascendance, and venturesome. We then examined the content of this shared variance by testing the relations of this variance with pleasant affect and a Social Interaction Scale that did not assess enjoyment of rewarding social activities. In accordance with our predictions, the variance common to the facets of extraversion was not related to this Social Interaction Scale. Furthermore, the higher order extraversion factor was strongly related to pleasant affect; and pleasant affect was unrelated to social interaction. Thus, sociability (the tendency to enjoy social situations simply because they provide the opportunity for social interaction) cannot form the glue that holds the facet of extraversion together. Instead, it appears that sensitivity to rewards (which should, theoretically, be strongly related to pleasant affect; Depue and Collins, 1999) provides this glue.

Study 2 demonstrated that this pattern of relations is not only replicable, but generalizable to a sample from a diverse group of nations. More specifically, we showed that (a) the structure obtained in the United States was not unique to the United States—it could be identified in a sample of individuals from 39 diverse nations—and (b) the structure was generalizable across samples of individuals from both individualistic and collectivistic cultures. In all cases, social interaction was unrelated to the higher order extraversion factor and to pleasant affect. Furthermore, the relation between extraversion and pleasant affect was always strong, though it did vary from individualistic countries to collectivistic countries. Thus, we found cross-cultural support for our contention that sensitivity to rewards, rather than sociability, forms the core of extraversion.

The inclusion of culture in our model also allows for unique predictions regarding the structure of personality across nations. When personality traits are guided solely by factor analysis rather than by strong theoretical considerations, cross-cultural generalizability becomes an either–or question: Either the structure generalizes to another culture or it does not. According to our model, the relations among the facets of extraversion are due to two factors: (a) one's internal sensitivity to rewards and (b) the rewardingness of social situations. In individualistic cultures, social situations tend to be rewarding, and thus, individuals who are sensitive to rewards tend to be sociable. Although the first factor should be unaffected by culture (as Gray, 1970, and Depue and Collins, 1999, hypothesized biological mechanisms underlying sensitivity to reward), the second factor may not be. Social situations may be more or less rewarding in different cultures. In the current study, we made a tentative prediction that social situations may be less rewarding in collectivistic cultures than in individualistic cultures. If this were the case, we should expect to find less of a relation between extraversion and pleasant affect—exactly what we found in the collectivistic sample. Although the relation was strong in all samples, it was significantly lower in the collectivistic sample.

In their review of cross-cultural approaches to the study of personality, Church and Lonner (1998) argued that personality psychologists need to go beyond studies of personality structure to investigate the generalizability of the nomological networks surrounding personality traits. Our study combines both approaches by examining the structure of extraversion in relation to pleasant affect. Positive emotionality is a central component of extraversion. If extraversion does not correlate with pleasant affect across cultures, it would suggest that the structure of the trait itself was not generalizable. Our study adds credence to the belief that the structure of extraversion can be identified in many cultures (e.g., McCrae & Costa, 1997), while providing support for the cross-cultural generalizability of the trait's nomological network.

There are clear directions for future research into the core features of the extraversion dimension. In the current studies, we did not directly assess extraverts' and introverts' enjoyment of rewarding and nonrewarding social and nonsocial situations. However, the reward sensitivity model can make explicit predictions about the pattern of differences that should emerge when extraverts' and introverts' enjoyment of different situations are compared. Specifically, extraverts should enjoy rewarding situations

more than introverts, regardless of whether they are social or not. We have examined hypothetical situation preference in a separate series of studies (Lucas & Diener, 1999) and have found support for the reward-sensitivity-as-core model.

In these studies we have attempted to answer the question "Why are sociable people happier than less sociable people" by instead asking "Why are happy people more sociable?" We believe that the answers provided by this study have important implications for the structure of extraversion. Yet, researchers cannot turn away from their original quest of determining the cause of differences in pleasant affect. Gray's (1970) theory posits a greater sensitivity to rewards on the part of extraverts; but what form does this sensitivity take? Do extraverts react more strongly to the same stimuli, do they pay more attention and remember positive stimuli more efficiently? Can these differences explain their greater pleasant affect? Theories that tie together the fundamental facets of extraversion with strong empirical evidence and theoretical links are important for the field of personality psychology. Yet we must advance beyond these theories to understand why differences in pleasant affect and sensitivity to rewards exist in the first place.

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(Appendix follows)

Appendix

Extraversion Scale Items, Groupings, and Standardized Regression Weights

Facet	Study 1	Study 2a	Study 2b
Affiliation			
1. You enjoy talking to strangers.	.89	.83	.87
2. You like talking to family members.			
3. You tell other people that you like them.			
4. You are a very friendly person.			
5. You enjoy talking with your friends.	.75	.76	.72
6. Talking to people is one of the most enjoyable activities in life.			
7. You never give other people compliments (r).			
8. You very much enjoy working with others.	.84	.79	.80
9. You never smile when you talk to friends (r).			
10. You tell other people that you think their ideas are good.			
11. When you first see people, you act like you are very happy to see them.			
Ascendance			
12. You are a leader of others.	.80	.77	.79
13. If someone does something you do not like, you tell them.			
14. You are self-confident.	.83	.78	.79
15. You like making decisions for groups.			
16. You always express your opinions in groups.	.80	.77	.78
17. You try to influence others.			
Venturesome			
18. You prefer to be with people who are exciting rather than quiet.	.88	.86	.83
19. You would rather go to a loud bar than a quiet restaurant.			
20. You prefer quiet parties to loud ones (r).	.73	.68	.71
21. You like doing exciting things with people more than just talking quietly.			
22. You prefer work situations that are noisy and crowded to ones that are orderly and quiet.	.57	.47	.50
23. You are at parties every week.			
Social Interaction			
24. You enjoy being alone (r).	.83	.81	.83
25. You like relaxing by yourself (r).			
26. You find it pleasant to work by yourself (r).	.83	.73	.74
27. You enjoy reading quietly (r).			
28. When relaxing you prefer being with others rather than being alone.			
29. You enjoy yourself when you must spend time by yourself (r).	.68	.70	.68
30. A quiet walk by yourself is pleasant (r).			
31. You prefer working on projects alone rather than in groups (r).			
New Social Interaction items (only included in Study 4)			
32. You rarely prefer spending time alone to spending time with others.			
33. Sometimes you just want to be alone (r).			
34. You rarely go out of your way to find time just for yourself.			
35. When given the choice between doing something alone and doing something with others, you rarely choose to do something alone.			
36. You always prefer being with others to spending time alone.			
37. You never feel the urge to spend some time alone.			
38. You rarely spend time alone.			
39. Sometimes you need to be alone to collect your thoughts (r).			
40. You always enjoy yourself more when you are with other people than when you are alone.			

Note. r = reverse-scored item.

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