Journal of Personality and Social Psychology
1996, Vol. 71, No. 3, 616-628

0022-3514/96/$3.00

Discriminant Validity of Well-Being Measures

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The convergent and discriminant validities of well-being concepts were examined using multitrait–multimethod matrix analyses (D. T. Campbell & D. W. Fiske, 1959) on 3 sets of data. In Study 1, participants completed measures of life satisfaction, positive affect, negative affect, self-esteem, and optimism on 2 occasions 4 weeks apart and also obtained 3 informant ratings. In Study 2, participants completed each of the 5 measures on 2 occasions 2 years apart and collected informant reports at Time 2. In Study 3, participants completed 2 different scales for each of the 5 constructs. Analyses showed that (a) life satisfaction is discriminable from positive and negative affect, (b) positive affect is discriminable from negative affect, (c) life satisfaction is discriminable from optimism and self-esteem, and (d) optimism is separable from trait measures of negative affect.

In recent years, psychologists have become increasingly concerned with the positive end of the psychological well-being spectrum. Instead of focusing solely on the factors that lead to disorders such as depression and anxiety, researchers have begun to examine the antecedents and consequences of happiness, self-esteem, optimism, and other indicators of positive well-being. Because these constructs often arise from different research traditions, the psychologists who develop them may not be familiar with findings outside their own field. As a result, research that systematically examines the relations among the constructs is scant. This criticism is particularly relevant for the area of subjective well-being. As Fiske (1982) pointed out in his discussion of discriminant validity, a narrowly defined construct is easily shown to be discriminable from other constructs. As the construct becomes broader however, one must make sure that it is truly different from those constructs that it subsumes or those to which it relates. Because of the global nature of well-being measures, researchers must be careful to evaluate the discriminant validity of the constructs they are investigating.

Researchers have identified two facets of subjective well-being: a cognitive judgment of life satisfaction (Andrews & Withey, 1976) and an emotional aspect consisting of independent positive affect and negative affect components (Diener & Emmons, 1984). The affective components represent two broad, underlying dimensions of basic emotions that consistently emerge across various descriptor sets, time frames, response formats, rotational schemes, languages, and cultures (Watson & Clark, 1991).

Whereas a great deal of research has been undertaken to illustrate the separability of positive affect from negative affect (e.g., Diener & Emmons, 1984; Watson & Clark, 1991; Watson & Tellegen, 1985), the theoretical distinction between the affective components of subjective well-being and the cognitive judgment of life satisfaction has not been subjected to rigorous analysis. Life satisfaction has been defined as a "global evaluation by the person of his or her life" (Pavot, Diener, Colvin, & Sandvik, 1991). This definition suggests that in making an evaluation of life satisfaction, a person examines the tangible aspects of his or her life, weighs the good against the bad, and arrives at a judgment of overall satisfaction. It is presumed that the global nature of this judgment makes it a somewhat stable evaluation that is not completely dependent on the affective state the person is in at the time of judgment.

Although the concept of life satisfaction is theoretically different from the amount of positive or negative affect a person experiences, it is clear that affect and life satisfaction are interrelated. When making judgments of life satisfaction, for example, people sometimes rely on current mood as an indicator of their overall satisfaction (Schwarz & Strack, 1991). It is also possible that when making a judgment of life satisfaction, people simply reflect on the amount of time they have spent in a happy mood versus the amount of time they have spent in an unhappy mood. On the other hand, current emotion theories (e.g., Lazarus, 1991; Ortony, Clore, & Collins, 1988; Weiner, 1985) suggest that cognitions play a major role in the experience of emotion. According to these models, cognitive appraisals of potentially threatening or beneficial stimuli elicit evolutionarily adaptive emotional responses. These cognitive evaluations of their lives may determine the amount of positive and negative affect people experience. If either of the processes just described is an accurate representation of life satisfaction judgments and affective experience, measures of life satisfaction and measures of affect should be empirically indistinguishable.

Emotion and subjective well-being theorists, however, suggest that there is more to emotions than evaluations of one's life, and there is more to life satisfaction than an evaluation of the amount of time spent in a positive versus negative mood (e.g., Diener, 1984). As a result, the cognitive and affective components of well-being should be distinguishable. Although measures of life satisfaction are correlated with both positive affect and negative affect, research has shown that the affective and

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This article is based on work supported by a National Science Foundation Graduate Research Fellowship.

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cognitive components can diverge, behaving differently over time and having differing relations with other variables (Diener, 1994). Unfortunately, these findings offer only indirect support for the discriminability of cognitive components from affective components. No sophisticated multitrait–multimethod matrix analyses or confirmatory factor analyses have been undertaken to illustrate the discriminability of cognitive components of subjective well-being from affective components (Diener, 1994).

Research is also lacking on the relations and distinctions among subjective well-being constructs and concepts developed within different research traditions. For example, Fleming and Watts (1980) stated that a widely agreed-on definition of self-esteem is "a personal judgment of one's own worth" (p. 921). Although there is a theoretical difference between evaluations of one's worth and one's life, it is possible that in actuality, people do not make such a distinction. In individualistic cultures, which focus on the importance of the self, judgments of life satisfaction could simply represent happiness with one's self. Although researchers believe that life satisfaction refers to a global judgment that includes evaluations of one's wealth, health, friendships, and romantic relationships (Diener, 1984), as well as satisfaction with one's self, it has yet to be determined whether life satisfaction is empirically distinguishable from self-esteem.

This neglect of discriminant validity is especially surprising in light of the empirically strong relation between self-esteem and life satisfaction. A. Campbell (1981), for example, found that self-esteem correlated .55 with life satisfaction in a national U.S. probability sample, and Fordyce (1988) found a correlation of .54 between his happiness measure and self-esteem. In a large study of college students from 49 countries, Diener and Diener (1995) found mean within-country correlations between life satisfaction and self-esteem of .44 and .43 for men and women, respectively. Using daily reports of mood and self-esteem, Diener and Emmons (1984) found that self-esteem correlated (across two studies) .46 and .34 with positive affect and −.40 and −.46 with negative affect. Similar results have been found in a national U.S. probability sample (Andrews, 1974), an adult married sample in the U.S. (Veroff, Feld, & Gurin, 1962), and by others (e.g., Czaja, 1975; Kozma & Stones, 1978; Pomerantz, 1978; Reid & Ziegler, 1980; Wilson, 1960).

Indirect evidence does suggest, however, that life satisfaction and self-esteem are not synonymous. Although the relation between the two is consistent and robust, the strength of this relation varies from weak to moderately strong across studies. More important, Diener and Diener (1995) illustrated that across cultures, the strength of this relation is moderated by the degree to which a country is individualistic versus collectivistic. In individualistic countries such as the United States, self-esteem and life satisfaction are highly correlated, whereas in collectivist cultures they are less so. This finding suggests that self-esteem is only one component of life satisfaction, the importance of which varies across cultures. Furthermore, Diener and Diener found that across countries, women's life satisfaction correlated more highly with men's life satisfaction and women's self-esteem correlated more highly with men's self-esteem than life satisfaction correlated with self-esteem within genders. The separability of life satisfaction and self-esteem, however, has yet to be tested directly.

In addition to the conceptual overlap with self-esteem, it is possible that subjective well-being constructs are confounded with optimism. According to Scheier and Carver (1985), optimism represents a general tendency to expect a favorable outcome in one's life. Presumably, people who believe that their actions will lead to a favorable outcome will persist in those actions, whereas those who believe that failure is inevitable will withdraw their efforts and disengage themselves from the goals they set. If there are individual differences in the tendency to expect success, the optimists should achieve more and have more good things happen to them, simply because their expectations lead to behaviors that bring them closer to their goals. The pessimists, however, may give up too quickly, experiencing fewer positive and more negative consequences, as a result of their failure to attain important goals. Although such expectations may have effects at a number of levels, ranging from the very specific ("I can finish this last exercise"), to the more general ("I can exercise to prevent a heart attack"), to extremely generalized expectancies about one's life ("I will not get sick anymore"), Scheier and Carver (1992) asserted that the *dispositional optimism* they investigated refers to the latter, global expectations about one's life. Again, there is a theoretical distinction between a general expectation for the future (optimism) and a global assessment of the external and internal conditions of one's life as a whole (life satisfaction), but the empirical difference between these two judgments is uncertain. That is, although researchers conceive of differences between optimism and life satisfaction, the two constructs might reflect the same underlying predisposition. As yet, no direct empirical test has addressed the discriminability of the two.

Perhaps a more damaging criticism is Smith, Pope, Rhodewalt, and Poulton's (1989) contention that optimism is synonymous with neuroticism and trait measures of negative affect. Smith et al. reported that in a multitrait–multimethod matrix with two measures of neuroticism and optimism, optimism measures correlated as highly with measures of neuroticism as with other measures of optimism. Furthermore, although optimism scores predicted future symptom reports, this correlation was eliminated when scores on a measure of neuroticism were controlled. Controlling for optimism scores, however, did not significantly reduce the correlation between negative affect and symptoms. The authors argued that this finding suggests that optimism is simply a weak measure of negative affect. Scheier et al. (1989), however, found opposite results in a study on men undergoing coronary artery bypass surgery. In this sample, optimism scores predicted future symptom reports, even after controlling for scores on a measure of negative affect.

Marshall, Wortman, Kusulas, Hervig, and Vickers (1992) suggested a possible resolution to this controversy in reporting their study of the relation of both positive affect and negative affect to a two-factor structure of optimism. They argued that their factor analyses revealed a two-factor structure of the Life Orientation Test, with the positively worded items loading on an Optimism factor and the negatively worded items loading on a Pessimism factor. Furthermore, these factors were correlated with positive affect/extraversion and negative affect/neuroticism, respectively. Scheier and Carver (1985) dismissed this structure as an artifact of the wording, but Marshall et al. argued that it is substantive and that conceptualizing the Life Ori-

entation Test as a measure of optimism and pessimism is more appropriate. In light of the observed ability of dispositional optimism to predict both physical (Scheier et al., 1989) and emotional (Carver & Gaines, 1987) recovery, further study on the discriminability of its measures is warranted.

Although subjective well-being, self-esteem, and optimism measures have been shown to have sufficient discriminant validity from similar constructs within their own research traditions, they have never been systematically related to one another. Through the use of a direct and rigorous method of evaluating discriminant validity (the multitrait–multimethod matrix), we examined the discriminability of (a) life satisfaction from positive and negative affect (and replicated the discriminability of positive affect from negative affect), (b) the cognitive subjective well-being component of life satisfaction from other cognitive global judgments of well-being, and (c) optimism from negative affect.

As D. T. Campbell and Fiske (1959) pointed out, there is no one correct way to construct a multitrait–multimethod matrix. There are often numerous measures of a single construct, or at least a number of formats by which the measure may be administered. Therefore, choosing two or three methods of measuring a construct may not provide an accurate picture of the discriminability of the construct. For this reason, we examined three separate multitrait–multimethod matrices for each of the research questions enumerated above. In Study 1, participants completed measures of life satisfaction, positive affect, negative affect, optimism, and self-esteem on two occasions 4 weeks apart and also obtained three informant reports from family and friends on the same constructs. In Study 2, participants provided longitudinal self-report data over a 2-year time period and again supplied informant reports. In Study 3, participants completed two different scales for each of the five constructs under investigation. We hypothesized that if the constructs are stable personality dispositions, they would show convergence with measures of the constructs assessed 4 weeks or 2 years later. Constructs that are discriminable from one another, however, would show less convergence across time. We speculated, however, that any convergence or discriminability found could be a result of the self-report measures used. Participants could believe that there was a difference between their cognitions about their selves and their cognitions about their lives, but their behavior may not reflect this difference. Informants, on the other hand, would see manifestations of traits in both the verbal and nonverbal behavior of the participants, and their reports would provide valuable information regarding the discriminability of the constructs in question. Finally, it could be argued that the use of the same scales to assess each of the constructs (whether by self-report or informant report) could result in unwanted method variance that gave the illusion of discriminant validity. For this reason, we used alternate scales for each of the five constructs.

D. T. Campbell and Fiske (1959) did not offer a clear definition of what different methods are. For the purpose of the present research, however, we defined different methods as methods not likely to be contaminated by the same constant sources of error of measurement. The methods we used were quite different because factors such as acquiescence and consistencies in number use across scales are unlikely to contaminate each measure. Through the use of longitudinal data, informant reports, and alternate forms of measures, we hoped to provide robust and replicable evidence regarding the discriminability of well-being measures.

In addition, the use of a number of multitrait–multimethod matrices leads to certain predictions based on the methods of assessment used. Although informants' reports of participants' emotional states are accurate and reliable, they often correlate less highly with participants' self-reports than do alternative forms of self-reports or self-reports on multiple occasions (Funder, 1989; Watson & Clark, 1991). Similarly, self-reports for constructs such as life satisfaction that are assessed 2 years apart should correlate less highly than self-reports assessed 4 weeks apart. Because there is greater chance of objective change occurring in the conditions over 2 years than over 4 weeks, and life satisfaction is presumably in part the evaluation of those conditions, convergence between two measures of life satisfaction should decrease as the time interval increases. For this reason, we predicted that the discriminant validities of the constructs would be more robust in shorter measurement intervals than in longer intervals and higher in comparisons of self-report data than in comparisons of self-report data with informant reports. However, any evidence for discriminant validity in analyses of informant reports or longitudinal analyses would offer strong support for the discriminant validities of the constructs under investigation.

Method

Study 1

Participants. Students in an introductory psychology class were given credit toward a class requirement in return for participating in this study. They were required to attend two sessions and collect informant reports from three friends or family members. Of the initial participants, 246 attended both sessions and acquired three informant reports. Thirty-four of these participants' data were dropped from the study because of missing data, leaving us with 212 participants who provided complete reports (132 females and 80 males).

Procedures. Participants arrived for the first session in groups of approximately 25–30. They were told the requirements of the study (completing the questionnaire in two self-report sessions and obtaining three informant reports) and then given the questionnaire. The questionnaire consisted of a number of personality and subjective well-being scales, five of which were related to the present research. The Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) is a measure of life satisfaction that includes 5 items with which respondents agree or disagree using a 7-point scale. The Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) is a measure of positive affect and negative affect that includes 20 emotion adjectives. Respondents use a 5-point scale to indicate the amount of time they spend experiencing each emotion. The Life Orientation Test (LOT; Scheier & Carver, 1985) is a 12-item measure of optimism that includes 4 positively worded items, 4 negatively worded items, and 4 filler items; respondents indicate the extent to which they agree or disagree with each item. A 9-item measure similar to Rosenberg's Self-Esteem Scale (Rosenberg, 1965) was used to measure self-esteem. (One item was accidently deleted from the original scale in Studies 1 and 3, leaving us with 9 items. The modified scale had coefficient alphas of .85, .85, and .82 in Study 1 and .89 in Study 3. Also, in comparisons between the original scale used in Study 2 and the scale with 1 item missing, the two scales correlated .99. Differences among correlations between the

original version and the modified version in Study 2 were minimal.) After the participants had completed the self-report questionnaire booklet (which required approximately 25 min), they each were given four informant questionnaire packets. These packets contained the same scales used in the self-report questionnaires, with the wording changed to an informant-report format. Instructions directed the friend or family member to answer the questions as the participant would answer them. For example, a question from the PANAS instructed the informant to indicate how often their participant would experience the emotion "elated." The informant questionnaires were dispensed in envelopes addressed to our laboratory so that informants could complete them and easily place them in a mailbox without the participant seeing them. Instructions informed the respondents that the questionnaires were not to be shown to the participants themselves. In return for their participation, informants were entered into a lottery with 10 prizes of $20 each.

Exactly 4 weeks later, participants returned for the second session. After being verbally reminded of their right to withdraw from the study, they received another packet containing the same scales they had completed in the first session, with the order of presentation reversed to control for order effects (the order of the scales was counterbalanced in both sessions as well as in the informant forms, with half of the respondents receiving one order and the other half receiving the other order). At the end of the second session, participants were informed as to how many informant reports had been returned and reminded of the requirement that three reports be returned. If the participant needed more, he or she was given extra packets. Participants who did not return all three informant reports were allowed to participate in a makeup session unrelated to this study in order to receive full credit.

Study 2

Participants. Data for Time 1 were collected in the fall of 1991 for some participants and the spring of 1992 for the remaining individuals. Participants were 222 students (mostly upper level psychology majors) enrolled in a semester-long course on subjective well-being. Personality, subjective well-being, and life events data were collected in class exercises completed either at home or during laboratory sessions. In the fall of 1993, 155 of the 222 participants were located. One hundred nineteen individuals responded to the follow-up study during the spring of 1994 and were able to acquire informant reports from at least two friends or family members who knew them well. Because of missing data, 10 participants were not used in the analyses, leaving a final sample of 109 (69 females and 40 males).

Procedures. During the fall of 1991 and the spring of 1992, participants completed each of the measures of life satisfaction, positive affect, negative affect, and optimism used in Study 1. The complete 10-item version of the Rosenberg Self-Esteem Scale was used as a measure of self-esteem. Approximately 2 years later, in the spring of 1994, participants were again asked to complete each of the five measures (in addition to other personality and subjective well-being questionnaires not relevant to this study) and were paid $20 or $25 (depending on how early the questionnaires were returned) for their participation. As an incentive to get participants to return informant reports, we also paid friends and family members $15. As in Study 1, informant reports consisted of the same measures of life satisfaction, positive affect, negative affect, optimism, and self-esteem that participants completed, with the wording changed to reflect the informant-report format.

Study 3

Participants. One hundred eighty-seven students in an introductory psychology class completed a two-part study on subjective well-being in partial fulfillment of a class requirement. Fifteen of these participants' data were removed from the study because of missing data, leaving 172 complete reports (95 females and 77 males).

Procedures. Participants arrived at the first session in groups of approximately 20. The rules for allocation of credit were clearly explained and the nature of the study was described, with participants being told that the experiment concerned subjective well-being and life events. Participants were then given a packet of questionnaires consisting of a number of personality and subjective well-being measures, including measures of life satisfaction, positive affect, negative affect, optimism, and self-esteem. As in Study 1, participants completed the SWLS, the PANAS, the LOT, and a self-esteem scale similar to the Rosenberg Self-Esteem Scale.

Two days later, participants returned to the laboratory to complete the second part of the study. At this time, more personality and subjective well-being measures were administered, including a different measure of each of the five constructs. As an alternative measure of life satisfaction, we used 5 items that had been developed for an early version of the SWLS (Diener et al., 1985). These items are similar to the items included in the published version of the SWLS and performed similarly in item analyses during scale development. We used the Affect Balance Scale (Derogatis, 1975), an affect measure consisting of 40 adjectives, to measure positive and negative affect. Using a 5-point scale from *never* (1) to *always* (5), respondents indicated the degree to which they experienced each of the emotions. As an alternative measure of optimism, we used the Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974), a 20-item instrument designed to measure the extent to which individuals possess hopeless and unfavorable expectations regarding future life outcomes. We chose this measure to allow for comparisons with previous research in which it was used as an alternative measure of optimism (Smith, Pope, Rhodewalt, & Poulton, 1989). We used Fleming and Courtney's (1984) revision of the Feelings of Inadequacy Scale as an alternative measure of self-esteem. This instrument consists of 36 items, and respondents indicate the extent to which they agree with an item or experience the feeling that the item describes. This measure has shown strong psychometric properties and is one of the most often used measures of self-esteem (Robinson, Shaver, & Wrightsman, 1991).

Results

Multitrait–Multimethod Matrix

Because of the unreliability of using only one informant report, participants who did not collect at least three reports in Study 1 and at least two reports in Study 2 were dropped from the analyses. For the participants who submitted the required number of complete informant reports, we averaged the reports to create a more reliable and valid "composite informant" (Sandvik, Diener, & Seidlitz, 1993). We computed correlations among each of the five different constructs (life satisfaction, positive affect, negative affect, optimism, and self-esteem) and each of the methods used (Time 1 self-report, Time 2 self-report, and informant report) for each of the three studies. We entered these correlations into matrices showing each construct and method variable (e.g., life satisfaction measured at Time 1) correlated with every other construct and method variable. Coefficient alphas are presented in parentheses, and correlations between the same construct measured with different methods (convergent validity coefficients) are shown in bold. We constructed three multitrait–multimethod matrices for each of the three studies to examine each of the three goals of the research. Although the same information could be gained using one multitrait–multimethod matrix encompassing all five traits, we organized

Table 1
Multitrait–Multimethod Matrix of Subjective Well-Being Measures in Study 1

	Time 1 self-report			Time 2 self-report			Informant report		
Measure	1	2	3	1	2	3	1	2	3
Time 1 self-report									
1. Life satisfaction	(.84)								
2. Positive affect	.52	(.85)							
3. Negative affect	−.36	−.14	(.83)						
Time 2 self-report									
1. Life satisfaction	**.77**	.44	−.32	(.87)					
2. Positive affect	.45	**.67**	−.10	.43	(.89)				
3. Negative affect	−.26	−.11	**.66**	−.30	−.14	(.85)			
Informant report									
1. Life satisfaction	**.48**	.28	−.16	**.49**	.29	−.14	(.86)		
2. Positive affect	.31	**.43**	−.14	.28	**.44**	−.01	.49	(.88)	
3. Negative affect	−.21	−.02	**.26**	−.21	−.13	**.35**	−.35	−.23	(.85)

Note. Correlations are based on 212 participants. All correlations above .18 are significant at $p < .01$. Coefficient alphas are in parentheses; convergent validity coefficients are in bold.

the correlations as three separate matrices for the sake of clarity and to address better the specific research questions.

Subjective well-being. Tables 1–3 show the correlations among each of the three measures of life satisfaction, positive affect, and negative affect in each of the three studies. According to D. T. Campbell and Fiske (1959), convergent validity in a multitrait–multimethod matrix is established by showing that different measures of the same trait (using different methods) are highly correlated. Furthermore, convergent validity coefficients (shown in bold in Tables 1–3) should be large enough to encourage further examination of discriminant validity. In this case, all convergent validity coefficients were significantly different from zero, and all but two were above .40. Even the two relatively low correlations (between informant-report and Time 1 self-report negative affect and between informant-report and Time 2 self-report negative affect in Study 1) meet D. T. Campbell and Fiske's criterion that they be large enough to encourage further examination of validity, inasmuch as they are higher than any other coefficients in the same columns or rows.

The first criterion that D. T. Campbell and Fiske (1959) recommended to evaluate discriminant validity is that a given convergent validity coefficient exceed the correlations in the corresponding row and column in its heterotrait–heteromethod block. Examination of Tables 1–3 shows that only 3 of 84 comparisons failed to meet this criterion. The 3 failures occurred in comparisons of informant reports and self-reports of positive affect and life satisfaction in Study 2 and were in accordance with our predictions of lower convergence between informant reports and self-reports. However, the success in the informant-report and self-report comparisons is encouraging, with 45 of 48 comparisons meeting D. T. Campbell and Fiske's first criterion.

D. T. Campbell and Fiske's (1959) second criterion requires that the convergent validity coefficients be higher than values

Table 2
Multitrait–Multimethod Matrix of Subjective Well-Being Measures in Study 2

	1991 self-report			1994 self-report			Informant report		
Measure	1	2	3	1	2	3	1	2	3
1991 self-report									
1. Life satisfaction	(.82)								
2. Positive affect	.47	(.76)							
3. Negative affect	−.48	−.32	(.83)						
1994 self-report									
1. Life satisfaction	**.68**	.29	−.32	(.82)					
2. Positive affect	.30	**.56**	−.20	.52	(.83)				
3. Negative affect	−.43	−.21	**.61**	−.51	−.36	(.85)			
Informant report									
1. Life satisfaction	**.41**	.26	−.24	**.52**	.38	−.30	(.88)		
2. Positive affect	.47	**.42**	−.22	.48	**.41**	−.30	.56	(.81)	
3. Negative affect	−.32	−.15	**.45**	−.38	−.25	**.44**	−.47	−.43	(.85)

Note. Correlations are based on 109 participants. All correlations above .23 are significant at $p < .01$. Coefficient alphas are in parentheses; convergent validity coefficients are in bold.

Table 3
Multitrait–Multimethod Matrix of Subjective Well-Being Measures in Study 3

Measure	1	2	3	1	2	3
1. SWLS	(.88)					
2. PANAS–PA	.42	(.81)				
3. PANAS–NA	−.36	.03	(.78)			
1. Life satisfaction	**.77**	.47	−.39	(.90)		
2. ABS–PA	.51	**.60**	−.38	.65	(.94)	
3. ABS–NA	−.49	−.15	**.66**	−.58	−.57	(.92)

Note. Correlations are based on 172 participants. All correlations above .15 are significant at $p < .01$. Coefficient alphas are in parentheses; convergent validity coefficients are in bold. SWLS = Satisfaction With Life Scale; PANAS = Positive and Negative Affect Schedules; PA = positive affect; NA = negative affect; ABS = Affect Balance Scale.

found in the monomethod–heterotrait triangles (the correlations between different traits assessed using the same method). The rationale behind this criterion is that the variance associated with a trait (across methods) should be higher than that associated with the method (across traits). Two patterns emerge in Tables 1–3. First, among the self-report measures, the second criterion was met in every case—the convergent validity coefficients for each construct as measured by two self-report assessments made 4 weeks apart or 2 years apart or with different scales were higher than the correlations among different constructs using the same methods. Among the informant reports, the second criterion was met approximately half the time (35 of 72 comparisons). As found in past research (Watson & Clark, 1991), positive affect was clearly discriminable from negative affect, in that both the positive affect and negative affect convergent validity coefficients exceeded the monomethod–heterotrait correlations between positive affect and negative affect. In addition, the life satisfaction convergent validity coefficients were always higher than the monomethod correlations between life satisfaction and negative affect in Study 1 and were higher in half the comparisons in Study 2. Neither life satisfaction nor positive affect convergent validities, however, exceeded the monomethod correlations between life satisfaction and positive affect, and the negative affect convergent validities did not exceed monomethod correlations between life satisfaction and negative affect.

The failure of the data to meet the second criterion can be understood by examining the rationale behind the second criterion and the nature of the constructs under investigation. According to D. T. Campbell and Fiske (1959), the convergent validities should be higher than monomethod–heterotrait values because the latter values should represent the amount of variance due to the method when different traits are being measured. The characteristics being examined are assumed to be absolutely independent, and therefore any correlation found is due solely to method variance. In the present research, however, we expected some relation between the characteristics and hence, would not have expected monomethod–heterotrait correlations of zero even had there been absolutely no method variance. Therefore, given the large amount of method variance between informant reports and self-reports, the failure to meet the second criterion is not surprising. D. T. Campbell and Fiske themselves advocated examining the particular nature of the constructs under investigation (and whether they are hypothesized to be independent) before evaluating the importance of the second criterion. When conditions are such that a failure of the second criterion can be expected, it is useful to look at the pattern of correlations as a whole—Campbell and Fiske's third criterion.

According to the third criterion, the same pattern of correlations should emerge in all heterotrait triangles in both the monomethod and heteromethod blocks. As Table 1 shows, this criterion was met remarkably well in Study 1—the pattern was the same for all nine heterotrait triangles, with no exceptions. Correlations between life satisfaction and positive affect were always greater than correlations between life satisfaction and negative affect, which in turn were always greater than correlations between negative affect and positive affect. This suggests that the variance associated with each construct (and their interrelations) was consistent and carried over across methods.

Study 3 also met this third criterion, with life satisfaction relating more highly to positive affect than to negative affect and both positive affect and negative affect relating more highly to life satisfaction than to each other. Study 2 succeeded in meeting this criterion with the exception of the lower-than-expected correlations between 1991 and 1994 life satisfaction and positive affect.

In all self-report analyses and in most informant-report analyses, the cognitive and affective components clearly discriminated. Furthermore, in all analyses, positive affect was discriminated from the theoretically independent construct of negative affect.

Life satisfaction, self-esteem, and optimism. Like the analysis of the discriminant validity of the subjective well-being measures, analysis of the discriminant validity of life satisfaction from self-esteem and optimism required that the convergent validity coefficients be sufficiently high to warrant the investigation of discriminant validity (see Tables 4–6). Although all coefficients were significantly different from zero, correlations between informant reports and self-reports of self-esteem were often quite small and failed to exceed the correlations of self-esteem with other constructs using the same method. Van Tuinen and Ramanaiah (1979) found that informants were often unable to make accurate judgments of self-esteem, and, for this reason, the indiscriminability of self-esteem from other constructs should be questioned. However, the self-report information from the three multitrait–multimethod matrices was valid for assessing the discriminant validity of self-esteem, and the informant data were useful for addressing the discriminant validity of life satisfaction and optimism.

In examining the discriminant validity of the three constructs using D. T. Campbell and Fiske's (1959) first criterion, we found a pattern similar to the one described in the subjective well-being matrices. First, regarding only the self-report measures of each construct, there was a considerable degree of discriminant validity among the constructs. In fact, there were only 4 failures in 36 comparisons, all 4 of which resulted from a low correlation between the LOT and the Hopelessness Scale. Among the informant-report data, however, slightly more comparisons failed the first criterion, with 8 of 48 validity coeffi-

Table 4
Multitrait–Multimethod Matrix of Life Satisfaction, Optimism, and Self-Esteem Measures in Study 1

	Time 1 self-report			Time 2 self-report			Informant report		
Measure	1	2	3	1	2	3	1	2	3
Time 1 self-report									
1. Life satisfaction	(.84)								
2. Optimism	.60	(.81)							
3. Self-esteem	.59	.57	(.85)						
Time 2 self-report									
1. Life satisfaction	**.77**	.59	.53	(.87)					
2. Optimism	.47	**.76**	.54	.52	(.87)				
3. Self-esteem	.49	.52	**.65**	.55	.57	(.85)			
Informant report									
1. Life satisfaction	**.48**	.41	.35	**.49**	.36	.49	(.86)		
2. Optimism	.40	**.50**	.34	.34	**.46**	.39	.56	(.82)	
3. Self-esteem	.32	.27	**.31**	.29	.27	**.40**	.56	.56	(.82)

Note. Correlations are based on 212 participants. All correlations above .18 are significant at $p < .01$. Coefficient alphas are in parentheses; convergent validity coefficients are in bold.

cients failing to exceed a heterotrait–heteromethod correlation. Even with the added difficulty of using informant reports to discriminate, however, the vast majority of comparisons met the criterion and 7 of the 8 failures resulted from low convergence between informant reports and self-reports of self-esteem.

To meet D. T. Campbell and Fiske's (1959) second criterion, these convergent validity coefficients also had to exceed the correlations among different traits measured with the same method. As discussed, the informant-report and self-report comparisons were the weakest in meeting this criterion. For the matrices examining the discriminant validity of life satisfaction from optimism and self-esteem, no convergent validity coefficient between informant reports and self-reports exceeded the correlations among the constructs using the same method. This was consistent with our predictions in light of the high method variance between informant reports and self-reports and the hypothesized nonindependence of the constructs.

Moving to the self-report data, we found stronger evidence for discriminant validity. In Study 1, for example, all convergent validity coefficients for each of the constructs exceeded the heterotrait–monomethod correlations. In Study 2, however, only life satisfaction met the second criterion. In Study 3, both the life satisfaction and self-esteem validity coefficients exceeded the heterotrait–monomethod correlations, but, again, a low correlation between the LOT and the Hopelessness Scale resulted in a failure of the second criterion for optimism. D. T. Campbell and Fiske's (1959) third criterion, that a consistent pattern of correlations emerge in each of the triangles, was not met for any of the samples, because all heterotrait correlations were quite similar.

Table 5
Multitrait–Multimethod Matrix of Life Satisfaction, Optimism, and Self-Esteem Measures in Study 2

	1991 self-report			1994 self-report			Informant report		
Measure	1	2	3	1	2	3	1	2	3
1991 self-report									
1. Life satisfaction	(.82)								
2. Optimism	.59	(.84)							
3. Self-esteem	.65	.66	(.89)						
1994 self-report									
1. Life satisfaction	**.68**	.31	.36	(.82)					
2. Optimism	.49	**.58**	.43	.55	(.85)				
3. Self-esteem	.51	.48	**.53**	.55	.72	(.89)			
Informant report									
1. Life satisfaction	**.41**	.28	.31	**.52**	.42	.42	(.88)		
2. Optimism	.53	**.44**	.40	.46	**.40**	.46	.60	(.68)	
3. Self-esteem	.43	.26	**.27**	.47	.36	**.45**	.58	.67	(.89)

Note. Correlations are based on 109 participants. All correlations above .23 are significant at $p < .01$. Coefficient alphas are in parentheses; convergent validity coefficients are in bold.

Table 6
Multitrait–Multimethod Matrix of Life Satisfaction, Optimism, and Self-Esteem Measures in Study 3

Measure	1	2	3	1	2	3
1. SWLS	(.88)					
2. LOT	.57	(.87)				
3. Self-esteem	.54	.69	(.89)			
1. Life satisfaction	**.77**	.61	.58	(.90)		
2. Hopelessness Scale	.49	**.53**	.54	.60	(.84)	
3. FIS	.43	.61	**.71**	.47	.48	(.93)

Note. Correlations are based on 172 participants. All correlations above .15 are significant at $p < .01$. Coefficient alphas are in parentheses; convergent validity coefficients are in bold. SWLS = Satisfaction With Life Scale; LOT = Life Orientation Test; FIS = Feelings of Inadequacy Scale.

Tables 4–6 provide evidence for the discriminability of life satisfaction from optimism and self-esteem. Although 17 of 84 comparisons failed to meet the first criterion, only 1 of these failures was the result of a weak convergent validity coefficient for life satisfaction. Similarly, the only comparison that failed to meet the second criterion for life satisfaction occurred in the particularly rigorous test of informant-report versus self-report data. All self-report comparisons (4-week longitudinal, 2-year longitudinal, and alternate forms) of life satisfaction succeeded in meeting the second criterion.

Optimism and negative affect. Tables 7–9 show the three multitrait–multimethod matrices for distinguishing optimism from negative affect. We included positive affect in each matrix for the purposes of comparison. If optimism correlated with positive affect as highly as it did with negative affect (which is theoretically independent and empirically separable from positive affect) and still showed evidence of discriminability from both, this would suggest that optimism and negative affect are not synonymous. Instead, it would suggest that positive affect and negative affect independently add variance to a construct that cannot be synonymous with either. For two constructs to be synonymous, they should not only correlate highly, but also have similar relations with other constructs. If negative affect correlated only slightly or not at all with positive affect, and optimism correlated highly with positive affect, this would be evidence of the discriminant validity of optimism from negative affect.

As may be seen in Tables 7–9, all convergent validity coefficients were significantly different from zero and sufficiently large to encourage further examination of discriminant validity. As mentioned earlier, the informant–Time 1 convergent validity coefficient for negative affect in Study 1 was lower than the other values, but it was nevertheless larger than the other values in the same row and column.

Regarding D. T. Campbell and Fiske's (1959) first criterion, we found that for Studies 1 and 2, there were no failures. Convergent validity coefficients for optimism, positive affect, and negative affect were larger than heterotrait–heteromethod correlations in all 72 comparisons. In Study 3, however, there were 3 failures, with the convergent validity coefficients for positive affect and optimism falling below the correlation between positive affect and optimism and the convergent validity coefficient

Table 7
Multitrait–Multimethod Matrix of Positive Affect, Negative Affect, and Optimism Measures in Study 1

	Time 1 self-report			Time 2 self-report			Informant report		
Measure	1	2	3	1	2	3	1	2	3
Time 1 self-report									
1. Positive affect	(.85)								
2. Negative affect	−.14	(.83)							
3. Optimism	.55	−.38	(.81)						
Time 2 self-report									
1. Positive affect	**.67**	−.11	.51	(.89)					
2. Negative affect	.10	**.66**	−.30	−.14	(.85)				
3. Optimism	.47	−.31	**.76**	.43	−.32	(.87)			
Informant report									
1. Positive affect	**.43**	−.02	.38	**.44**	.13	.38	(.88)		
2. Negative affect	−.14	**.26**	−.20	−.01	**.35**	−.18	−.23	(.85)	
3. Optimism	.32	−.23	**.50**	.22	−.30	**.46**	.56	−.50	(.82)

Note. Correlations are based on 212 participants. All correlations above .18 are significant at $p < .01$. Coefficient alphas are in parentheses; convergent validity coefficients are in bold.

Table 8
Multitrait–Multimethod Matrix of Positive Affect, Negative Affect, and Optimism Measures in Study 2

	1991 self-report			1994 self-report			Informant report		
Measure	1	2	3	1	2	3	1	2	3
Time 1 self-report									
1. Positive affect	(.76)								
2. Negative affect	−.32	(.83)							
3. Optimism	.51	−.57	(.84)						
1994 self-report									
1. Positive affect	**.57**	−.20	.30	(.83)					
2. Negative affect	.22	**.62**	.44	−.35	(.85)				
3. Optimism	.27	−.40	**.58**	.38	−.64	(.85)			
Informant report									
1. Positive affect	**.42**	−.22	.36	**.41**	.31	.35	(.81)		
2. Negative affect	−.15	**.45**	−.26	−.25	**.45**	−.33	−.43	(.85)	
3. Optimism	.31	−.32	**.44**	.34	−.36	**.40**	.58	−.57	(.68)

Note. Correlations are based on 109 participants. All correlations above .23 are significant at $p < .01$. Coefficient alphas are in parentheses; convergent validity coefficients are in bold.

for optimism falling below the correlation between negative affect and optimism. This is a somewhat contradictory finding, in that optimism failed to meet the first criterion in comparisons with both positive and negative affect—two theoretically independent and empirically separate constructs.

Regarding the second criterion, a pattern similar to that observed in the first two series of multitrait–multimethod matrices emerged: Discriminant validity was stronger in self-report data than in informant-report data. Only 3 of 36 comparisons failed to meet the second criterion in the self-report data from Studies 1 and 2, whereas very few (11 of 36) informant–self convergent validity coefficients exceeded heterotrait–monomethod correlations. In this series of multitrait–multimethod matrices, we found the first indications of a separate predicted pattern—greater discriminant validity in longitudinal data assessed across shorter time periods. Of the 3 self-report failures, all came from data spanning 2 years and none from the data spanning 4 weeks.

Table 9 shows that in the self-report data assessed over a span of 2 days with alternate forms, convergent validity coefficients for optimism exceeded heterotrait–monomethod correlations only half the time. All of the successes appeared among the Time 1 measures of the PANAS and the LOT, and the failures were found in the correlations between the Affect Balance Scale and the Hopelessness Scale. This replicated the somewhat contradictory finding noted earlier that in the more rigorous tests optimism showed less discriminability from affect; however, it was unable to meet D. T. Campbell and Fiske's (1959) criteria for discriminant validity in comparisons with both positive and negative affect, rather than from just negative affect.

The third criterion was met to some degree in each of the studies, with positive and negative affect correlating higher with optimism than with each other (except when measured by the Affect Balance Scale). There was no consistent pattern, however, in the correlations between optimism and positive affect and between optimism and negative affect. The correlation between optimism and positive affect exceeded that between optimism and negative affect 12 times, and the reverse was true 10 times. The average correlation (using r to Z transformations) between optimism and negative affect was .40, and that between optimism and positive affect was .42. This suggests that optimism could not have been synonymous with negative affect, because it correlated at least as highly with positive affect as with negative affect. In Study 3, for example, positive affect correlated .45 with the LOT and negative affect correlated −.48 with the LOT, but positive affect correlated only −.03 with negative affect. This suggests that optimism shared as much variance with positive affect as with negative affect but that the variance that positive affect added was independent from that added by negative affect.

It can be argued, however, that a more appropriate examination of the discriminant validity of optimism from affect would be to examine the two-factor structure of optimism measures in relation to positive and negative affect. However, multitrait–multimethod matrices that included correlations among positive affect, negative affect, optimism (defined as the positively worded items of optimism scales), and pessimism (defined as the negatively worded items of optimism scales) showed no consistent pattern of failures across the three studies. It was not the case that pessimism consistently failed to be discriminable from negative affect and optimism consistently failed to be discriminable from positive affect (as Marshall et al., 1992, would suggest). Instead, pessimism occasionally failed to be discriminable from positive affect, negative affect, and optimism, and optimism occasionally failed to be discriminable from positive affect, negative affect, and pessimism. The average correlation between optimism and pessimism across all studies (presented in lieu of the full multitrait–multimethod matrices for the sake of brevity) was .40. The average correlation between optimism and positive affect was .38, and that between optimism and negative affect was .33. The average correlations between pessimism and positive affect (.37) and negative affect (.36) were quite similar. This pattern does not suggest that optimism was synonymous with positive affect or that pessimism was synony-

Table 9
Multitrait–Multimethod Matrix of Positive Affect, Negative Affect, and Optimism Measures in Study 3

Measure	1	2	3	1	2	3
1. PANAS–PA	(.81)					
2. PANAS–NA	−.03	(.78)				
3. LOT	.45	−.48	(.87)			
1. ABS–PA	**.60**	−.38	.66	(.94)		
2. ABS–NA	−.15	**.66**	.53	−.57	(.92)	
3. Hopelessness Scale	.27	−.40	**.53**	.55	−.55	(.84)

Note. Correlations are based on 172 participants. All correlations above .15 are significant at the $p < .01$ level. Coefficient alphas are in parentheses; convergent validity coefficients are in bold. PANAS = Positive and Negative Affect Schedule; PA = positive affect; NA = negative affect; LOT = Life Orientation Test; ABS = Affect Balance Scale.

mous with negative affect. It simply indicates that all four constructs were highly correlated and that pessimism was just as highly correlated with positive affect and optimism as it was with negative affect.

This pattern of results does not support a two-factor structure of optimism in which optimism scales (consisting of positively worded items) relate to positive affect and pessimism scales (consisting of negatively worded items) relate to negative affect. Instead, the results suggest that optimism and pessimism are (as Scheier & Carver, 1985, suggested in their original discussion of the LOT) highly correlated with each other and highly correlated with both positive and negative affect. Conceptualizing optimism as having a two-factor structure only weakens the ability of optimism measures to discriminate from both positive and negative affect.

Regression Analyses

Following the advice of Fiske (1982), we used an additional method of analysis to evaluate the discriminant validities of the constructs. If the finding of discriminability replicates across methods of analyses, the finding is more robust. In this case, we used regression analyses to predict well-being scores using the other constructs. If, for example, self-esteem was the only construct to predict life satisfaction, the two would be synonymous. If other constructs added to the prediction, however, there would be additional evidence for the discriminant validities of the constructs.

To provide the most stable and reliable scores for the regression analyses, we performed principal-components factor analyses on the multiple measures of each of the constructs for each of the studies. For each construct, one factor emerged that accounted for between 62% and 89% of the variance. Factor scores were retained and used for the regression analyses. All variables were entered simultaneously.

When we examined whether positive affect, negative affect, optimism, and self-esteem predicted life satisfaction scores, all variables entered the equation in at least one of the studies. More important, more than one variable entered the equation in every one of the analyses. In Study 1, positive affect ($\beta = .2038, p < .01$), optimism ($\beta = .2475, p < .01$), and self-esteem ($\beta = .3385, p < .01$) entered the regression equation; in Study 2, positive affect ($\beta = .2257, p < .01$), optimism ($\beta = .2161, p < .05$), and self-esteem ($\beta = .3604, p < .01$) entered; and in Study 3, positive affect ($\beta = .3082, p < .01$), negative affect ($\beta = .1773, p < .01$), and optimism ($\beta = .3994, p < .01$) entered. This indicates that none of the variables entered into the equation could account for scores on measures of life satisfaction.

We found similar results for all constructs investigated in these studies. When we used each construct as the dependent variable in a regression equation in which all other variables were entered simultaneously, each dependent variable was predicted by more than one construct. This evidence again suggests that optimism (whether measured as a single construct or measured as two factors of optimism and pessimism) related to both positive affect and negative affect. Furthermore, a purely affective conceptualization of optimism was lacking, because the more cognitive constructs of life satisfaction and self-esteem entered into a regression equation predicting optimism.

These results provide further evidence for the findings of the multitrait–multimethod matrix analyses. Life satisfaction was not synonymous with affect or with other cognitive conceptualizations of well-being, such as optimism or self-esteem. Similarly, optimism, whether conceptualized as two factors of optimism and pessimism or as one global optimism construct, was not synonymous with and was discriminable from negative affect.

Discussion

The present studies allow us to draw a number of important conclusions regarding the discriminant validity of well-being constructs. Not only did we analyze multiple multitrait–multimethod matrices to allow replication of discriminant validity evidence, but we used different methods in each analysis. In addition to advancing knowledge of the convergence between a variety of methods of measurement, this methodology strengthens evidence of discriminant validity and allows researchers to examine the particular methods by which a construct can be measured and be discriminated from other similar constructs.

The results show that life satisfaction was successful in meeting D. T. Campbell and Fiske's (1959) criteria for discriminant validity from both the affective components of subjective well-being and the more cognitive traits self-esteem and optimism. Using self-report data measured across 4 weeks or 2 years or with alternative scales, we found that life satisfaction never failed to meet the first or second criterion. Furthermore, when we used the particularly rigorous test of comparisons based on informant-report data (in which convergent validity coefficients could be expected to be lower), in two separate studies life satisfaction failed to meet the first criterion only 4 times in 32 comparisons with positive affect, negative affect, optimism, and self-esteem. These are the first rigorous analyses to show that the construct of life satisfaction and the measures available to assess it can be discriminated from the affective components of subjective well-being and from the conceptually similar constructs optimism and self-esteem.

The present studies also replicate past research that demonstrated that positive affect and negative affect are not simply

opposite poles on the same continuum. Instead, they are clearly discriminable (with no failures of the first or second criterion using self-report data and only two failures of the second criterion using informant-report data) and in many cases appear to be only slightly correlated.

Finally, the present studies add to the literature regarding the separability of optimism from negative affect and the importance of the two-factor structure of scales such as the LOT. In a pattern similar to that found for life satisfaction, optimism succeeded in meeting D. T. Campbell and Fiske's (1959) first two criteria in the self-report longitudinal data spanning 4 weeks and 2 years. In addition, it met the first criterion in informant reports from Studies 1 and 2. However, in Study 3, convergent correlations between the LOT and the Hopelessness scale did not exceed heterotrait–monomethod correlations between optimism and positive affect and between optimism and negative affect. In light of the ability of the LOT to be discriminable in Studies 1 and 2, in which both informant reports and self-reports were used, this failure may be regarded not as a failure of the discriminability of optimism from affect, but as a failure of the Hopelessness Scale to measure the same construct as the LOT. This explanation accounts for the lack of discriminability exhibited by optimism in past research in which only one multitrait–multimethod matrix was used and the Hopelessness Scale was used as an alternate measure of optimism (Smith, Pope, Rhodewalt, & Poulton, 1989). Only through the use of multiple multitrait–multimethod matrices that include a variety of methods of measurement can researchers determine whether a construct's failure to meet D. T. Campbell and Fiske's criteria is due to a lack of discriminant validity of the construct or to nonequivalence of different measures purported to measure it. The pattern of results presented here suggest that the latter is the case.

Similarly, at first glance, the numerous failures of self-esteem to discriminate from other constructs suggest that this construct is not robust and not discriminable from other similar constructs. Closer examination of the results, however, reveals that self-esteem's failure to discriminate often occurred when informant-report measures of self-esteem were used. When self-report measures (whether longitudinal or alternate forms) were used, self-esteem was as successful as the other constructs in meeting D. T. Campbell and Fiske's (1959) criteria for discriminant validity. These analyses suggest that just as the Hopelessness Scale may not be an appropriate measure of the global optimism that Scheier and Carver (1985) assessed with the LOT, informant reports may not be an appropriate method of assessing self-esteem. Instead, they may reflect a global perception of positive cognitions.

The present studies indicate that conceptualizing the LOT as a two-factor instrument with separate subscales for optimism and pessimism reduces the degree to which the instrument meets psychometric criteria such as the desire for discriminant validity from similar constructs. Dividing the LOT into two subscales does not produce a more appropriate pattern in which optimism relates to positive affect and pessimism relates to negative affect. Instead, it demonstrates that the ability of optimism and pessimism to be discriminable from themselves or from both positive and negative affect is reduced. In all three studies, optimism as measured by the entire LOT, the Hopelessness Scale, and the subscales of optimism and pessimism correlated as highly with positive affect as with negative affect. Because positive and negative affect are theoretically independent and empirically separable (and only slightly correlated, according to the present studies) high correlations with both positive affect and negative affect indicate that optimism is not synonymous with either one. Instead, it is, as Carver et al. (1993) have suggested, a global, multifaceted construct that is highly correlated (but separable) from other measures of well-being, including negative and positive affect.

Examining the pattern of correlations in each of these studies provides important information regarding the discriminant validity of life satisfaction, positive affect, negative affect, optimism, and self-esteem and the validity of different measures of these constructs. This investigation also suggests a possible problem with the use of informant reports of subjective internal feelings. Although informant reports show some ability to discriminate between the constructs examined, this discrimination is markedly less than in analyses using only self-reports. For example, although, as stated earlier, negative affect is theoretically and empirically independent from positive affect (Diener & Emmons, 1984; Watson & Tellegen, 1985), in the informant monomethod triangle in Studies 1 and 2, the correlations between positive and negative affect were −.23 and −.43, respectively, compared with −.14 in each of the other triangles in Study 1 and −.32 and −.36 in Study 2. These elevated correlations suggest that informants do not have the ability to discriminate successfully between somewhat similar concepts. Instead, they have a tendency to rate the person similarly on all positive traits or all negative traits. As Funder (1989) has pointed out, however, informant judgments are impressive not because they are perfect, but because "in the face of enormous difficulties . . . they manage to have any accuracy at all" (p. 212).

There is a growing body of evidence that seems to illustrate the discriminant validity of subjective well-being measures from other global, cognitive constructs, such as self-esteem. However, to be certain of the robustness of this finding, researchers must examine the relation in a number of ways. One possible way is to examine the factors that influence both life satisfaction and other constructs—to examine each construct's nomological net. For example, Diener (1984) reported that in most studies of life satisfaction Blacks report lower levels of life satisfaction than do Whites. Tashakkori (1993), however, reported that many studies of self-esteem report higher self-esteem in African Americans than in Whites. Similarly, Diener and Fujita (1995) found that personal resources correlated much more highly with judgments of life satisfaction than with affect. Researchers investigating the relationship between optimism and neuroticism and negative affectivity argue that whereas optimism scores can predict future objective symptoms, negative affect can predict only symptom reports—a more subjective construct. If actual symptoms (as assessed by a physician) are examined, neuroticism and negative affect cannot predict them. Although these studies alone cannot illustrate the discriminant validity of these constructs, the pattern of relations can. Establishing that each construct has a unique nomological net of relations can support the claim of discriminant validity.

By examining the network of relations, future researchers can

also overcome one of the limitations of the present study—the homogeneity of the sample used. Because only university students were recruited as participants, it is difficult to say whether the discriminant validity of these scales will generalize to their use in all populations. There are two reasons to remain optimistic about the constructs' discriminant validity. First, Study 2 measured students before and after a period of potentially intense change—graduation from college and entrance into the job market. Some participants had found a job; others had not. Some had married; others had stayed single. If life satisfaction before these changes is correlated with life satisfaction after these changes more highly than life satisfaction is correlated with negative affect (both measured at Time 1), it not only is strong evidence for the discriminant validity, but also suggests that the discriminant validity may generalize to populations other than students. Second, the homogeneity of the sample should only hurt the ability of the constructs to exhibit evidence of discriminant validity. A restricted range reduces correlations between two measurements of the same construct, making it harder for convergent validity coefficients to exceed correlations among different constructs. This is not to say that the present research can completely answer the question of whether the constructs are discriminable in all cultures, but it is an encouraging first step. Future research must examine these constructs in other contexts and in other cultures to discover the generalizability of the evidence for discriminant validity found here.

Conclusion

These studies add to past research by illustrating the value of examining a variety of global evaluations of psychological well-being. In three studies, we used various methods to measure the convergence and divergence of cardinal aspects of psychological well-being. In doing so, we found evidence for moderate to very good convergent validity for each of the constructs across longitudinal self-reports, informant reports, and alternate scales. In addition, there was moderate to very good evidence for the discriminant validities of (a) positive affect from negative affect, (b) life satisfaction from positive and negative affect, (c) life satisfaction from optimism and self-esteem, and (d) optimism from negative affect (and positive affect). Although the degree to which each of the constructs met D. T. Campbell and Fiske's (1959) three criteria of discriminant validity varied according to the method of assessment used, it is clear that there are a number of self- and informant-report formats and methods that allow these constructs to be distinguished. Although informants are not as successful as self-reports in distinguishing similar constructs and have a tendency to view positive constructs as similar to each other and opposite to negative constructs, they do show some ability to discriminate. Thus, future investigators can feel confident that they are measuring different constructs of well-being if they rely on established scales and use the proper assessment formats for them.

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Received April 11, 1995
Revision received January 11, 1996
Accepted January 21, 1996 ■