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THE BIG FIVE TRAITS AS PREDICTORS OF SUBJECTIVE AND PSYCHOLOGICAL WELL-BEING[1]

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Summary.—Despite considerable research on personality and "hedonic" or subjective well-being, parallel research on "eudaimonic" or psychological well-being is scarce. The current study investigated the relationship between the Big Five traits and subjective and psychological well-being among 211 men and women. Results indicated that the relationship between personality factors and psychological well-being was stronger than the relationship between personality factors and subjective well-being. Extraversion, neuroticism, and conscientiousness correlated similarly with both subjective and psychological well-being, suggesting that these traits represent personality predispositions for general well-being. However, the personality correlates of the dimensions within each broad well-being type varied, suggesting that the relationship between personality and well-being is best modeled in terms of associations between specific traits and well-being dimensions.

Optimal psychological functioning or *well-being* is an important index of quality of life at the individual and collective level (Siegrist, 2003). Well-being has been described as an "unambiguously desirable psychological state" (Schmutte & Ryff, 1997, p. 551), and attaining a sense of well-being is an important goal for most people (Diener, Scollon, & Lucas, 2004). In addition, well-being is associated with health and longevity (Danner, Snowdon, & Friesen, 2001; Lyubomirsky, King, & Diener, 2005), translating into economic and social well-being (Siegrist, 2003). Accordingly, understanding individual differences in well-being is an important research agenda for psychology.

Hedonic or *subjective well-being* generally has been the focus in the well-being literature; however, eudaimonic or *psychological well-being,* popularized in humanistic psychology, is steadily gaining credibility in personality and social psychology (Ryff & Keyes, 1995; McGregor & Little, 1998; Ryan & Deci, 2001). As such, well-being is increasingly recognized as a multidimensional construct consisting of both hedonic and eudaimonic dimensions (Ryan & Deci, 2001). Keyes, Shmotkin, and Ryff (2002, p. 1009) described subjective and psychological well-being as "related but distinct aspects of positive psychological functioning".

While there has been considerable interest in the traits that pre-

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dict subjective well-being (see DeNeve & Cooper, 1998; Steel, Schmidt, & Schultz, 2008), similar research on psychological well-being has been scarce. Furthermore, previous studies have examined subjective or psychological well-being dimensions separately (Keyes, *et al*., 2002). An important question is whether personality traits relate to subjective well-being and psychological well-being to the same extent and in the same way. Identifying the traits that are related to subjective and psychological well-being is important in securing a complete understanding of well-being as a construct. The goal of the current study was to investigate the relationship between the Five Factor Model of personality and dimensions of subjective well-being (positive affect, negative affect, satisfaction with life) and psychological well-being (autonomy, personal growth, positive relations, purpose in life). According to the Five Factor Model, much of the variance in personality can be accounted for by the five factors extraversion, neuroticism, conscientiousness, agreeableness, and openness (Costa & McCrae, 1992; McCrae & John, 1992; Goldberg, 1993). These Big Five factors do not account for all variability in personality, but provide an organizing framework for thinking about alternative measures. To the extent that the Five Factor Model captures the basic dimensions of normal personality, it should be useful in describing the structural relationship between personality and well-being (Compton, 1998).

Defining Well-being

Subjective well-being is typically operationalized as the composite of happiness and satisfaction, the affective and cognitive dimensions, respectively (Deci & Ryan, 2006). Happiness is often defined as an appropriate balance of positive and negative affect, and satisfaction is usually defined in terms of global life satisfaction, although domain-specific satisfaction might also be used, such as job satisfaction (Diener, Oishi, & Lucas, 2003). Thus, subjective well-being is a three-dimensional construct consisting of the presence of positive affect, the absence of negative affect, and life satisfaction (Diener, 1984; Lucas, Diener, & Suh, 1996). This operationalization of subjective well-being has pervaded the literature and is adopted in the present study.

Psychological well-being is needed as a construct because subjective well-being does not capture all aspects of positive functioning (Ryan & Deci, 2001). Diener, *et al*. (2003) argued that subjective well-being is a necessary but not sufficient condition for the "good life". While subjective well-being focuses on pleasure, pain avoidance, and overall satisfaction, psychological well-being is based on a broader approach which includes identity, meaning, and relatedness (Ryff & Singer, 1996). Psychological well-being is about actualizing human potential and living well; "[it] is

not so much an outcome or end state as it is a process of fulfilling or realizing one's daimon or true nature" (Deci & Ryan, 2006, p. 2).

Building on the literature on adult development, clinical psychology, and mental health, Ryff (1989) presented a multifaceted model of psychological well-being consisting of six dimensions: autonomy, environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance. Findings show that environmental mastery and self-acceptance tend to correlate highly with dimensions of subjective well-being such as happiness and life satisfaction, whereas autonomy, personal growth, positive relations, and purpose in life tend to correlate only moderately with these dimensions (Ryff & Keyes, 1995; Compton, 1998; McGregor & Little, 1998). For this reason and consistent with other studies (e.g., McGregor & Little, 1998), environmental mastery and self-acceptance were not included in the present study. Accordingly, discussion of psychological well-being herein will focus on the remaining four dimensions: autonomy, personal growth, positive relations, and purpose in life.

Autonomy is characterized by a sense of authority and self-determination; it involves evaluating oneself according to self-imposed criteria rather than looking for social approval. Personal growth is characterized by openness to new things and a sense of continued growth and development. It is about making the most of one's skills and striving to reach one's full potential by using self-knowledge to guide self-improvement. Positive relations involves developing and maintaining warm and trusting relations with others, demonstrating a capacity for affection, empathy, and intimacy, and showing concern for others' welfare. Finally, purpose in life is about finding meaning and purpose in one's past and present life, typically through the realization of goals and objectives (for full definitions, see Ryff, 1989).

Keyes, *et al*. (2002) described psychological well-being as "challenged thriving". Studies have linked variation in the dimensions of psychological well-being to socio-demographic variables such as age, gender, and education, as well as a range of life events and other stressors, including achievement in the work domain, body consciousness, care giving, community relocation, health and aging, marital status change, parenthood, personal projects, and recovery from major illness (for a review, see Keyes, *et al*., 2002).

Researchers in favor of the hedonic approach have argued that subjective well-being is a preferable construct to psychological well-being because it does not prescribe particular pathways for achieving the "good life" (e.g., Diener, Sapyta, & Suh, 1998). Those in favour of the eudaimonic approach have argued that the psychological well-being construct provides a more complete definition of the "good life" (e.g., Ryff, 1989). Tak-

ing the middle ground, others have suggested that factors represented by psychological well-being are universally important for attaining subjective well-being. For example, Deci and Ryan's Self-Determination Theory (2000) proposes that satisfaction of the three basic psychological needs of autonomy, competence, and relatedness is an important predictor of subjective well-being. Similarly, Seligman (2002) described constructs that are closely related to psychological well-being, such as engagement and meaning, as "routes" to happiness.

Personality as a Determinant of Well-being

In general, theories of individual differences in well-being have taken either a situational or dispositional approach (Heller, Watson, & Ilies, 2004). Within the situational approach, contextual factors, such as life events, are theorized to cause well-being independently of personality (Magnus, Diener, Fujita, & Payot, 1993). According to the dispositional approach, certain traits predispose people to higher or lower well-being. Personality may affect well-being either *directly* independent of life events, *indirectly* via life events, or *interactively* with life events by moderating their effect on well-being, such as through cognitive appraisal or coping (Bolger & Schilling, 1991; McCrae & Costa, 1991; Magnus, *et al*., 1993; Bolger & Zuckerman, 1995).

While early thinking on the determinants of well-being was dominated by the situational approach, recently the literature has shifted to the dispositional approach, based on evidence that well-being is relatively stable and thus more likely to reflect internal personal characteristics. Several studies support the dispositional approach. For instance, both personality and well-being measures show strong correlations over time and have strong genetic components. Bouchard and Loehlin's work (2001) is cited as evidence that 50% of variance in personality is inherited. Lykken and Tellegen (1996) concluded that around 50% of well-being is inherited. More recently, researchers concluded that 80% of the stable component of well-being was accounted for by genetics (Nes, Roysamb, Tambs, Harris, & Reichborn-Kjennerud, 2006). A study of 973 twin pairs (Weiss, Bates, & Luciano, 2008) found that a three-item measure of subjective well-being correlated .31 for monozygotic twins, but only .10 for dizygotic twins. Furthermore, while life events have been linked to depression and other psychiatric symptoms, even major events have been found to exert little effect on well-being (DeNeve & Cooper, 1998; Heller, *et al*., 2004; for a dissenting view, see Diener, Lucas, & Scollon, 2006). One view is that adaptation to such events is so rapid that well-being is not measurably affected. For instance, according to the Dynamic Equilibrium Model (Headey & Wearing, 1989), each person has a moderately stable level of stress and well-being which can be predicted on the basis of stable person characteristics. While

positive or negative events are associated with a fluctuation in well-being, this effect is transient because stable personal characteristics ensure that the individual is quickly returned to the set point.

Personality and Subjective Well-being

Early research emphasized extraversion as the primary determinant of subjective well-being; however, recent work has identified neuroticism as the major determinant (e.g., DeNeve & Cooper, 1998; Bostic & Ptacek, 2001; Vittersø, 2001; Vittersø & Nilsen, 2002; Hayes & Joseph, 2003). As noted by Bostic and Ptacek (2001), neuroticism should correlate strongly with subjective well-being given that it is defined by emotional instability. The relationship of extraversion and neuroticism with subjective well-being may be a function of genetically influenced biological factors such as a neural approach–avoidance system associated with affect. McCrae (1983) suggested that the state positive and negative affect measures which make up part of subjective well-being should correlate strongly with the corresponding personality trait measures of positive and negative affect. This would lead to an expectation of strong correlations between extraversion and state positive affect and neuroticism and state negative affect. However, positive affect is only one component of extraversion, which also includes other important components such as activity and sociability.

In contrast, the relationship of the other traits to subjective well-being may be a function of environmental factors such as reinforcement (DeNeve & Cooper, 1998). For instance, conscientiousness and agreeableness may enhance subjective well-being instrumentally to the extent that these traits facilitate positive experience in the achievement and social domains, respectively (McCrae & Costa, 1991; Hayes & Joseph, 2003). Openness could affect well-being indirectly via its effect on the subjective experience of events (Beck, 1975; Ellis & Grieger, 1977). Past research has shown that openness is positively related to both positive and negative affect, suggesting that those who score high on openness experience both good and bad events more intensely, thus amplifying positive and negative emotional reactions (McCrae & Costa, 1991; Kling, Ryff, Love, & Essex, 2003).

Comprehensive assessments of the correlations between personality and subjective well-being come from the large-scale meta-analyses that have been conducted by DeNeve and Cooper (1998) and Steel, *et al*. (2008). The results of these studies are summarized in Table 1. In general, neuroticism is negatively related to subjective well-being, while extraversion, conscientiousness, and agreeableness are positively related to subjective well-being. Openness is positively correlated with both positive affect and negative affect.

DeNeve and Cooper (1998) examined relationships between 137 distinct personality constructs, categorized in terms of the Five Factor Mod-

el, and subjective well-being. They found moderate relationships between all of the Big Five factors and life satisfaction, with particular emphasis on neuroticism and conscientiousness. Several variables showed moderate relationships with positive affect, with extraversion showing the largest relationship. Neuroticism had the largest correlation with negative affect.

Steel and colleagues (2008) argued that combining a wide range of personality measures, as was done in DeNeve and Cooper (1998), may attenuate correlations between personality and subjective well-being. They performed a separate meta-analysis based only on the NEO-Personality Inventory and obtained meta-analytic correlations that were substantially larger than those reported by DeNeve and Cooper (1998). Steel and colleagues found that neuroticism had the highest correlation with life satisfaction and negative affectivity, whereas extraversion had the highest correlation with positive affect.

The large differences in the results of the two meta-analyses suggest that the scale used to measure the Big Five moderates the relationships with subjective well-being. Both meta-analyses suggest that neuroticism is by far the strongest predictor of negative affect and is also the strongest predictor of life satisfaction. In addition, both meta-analyses suggest that extraversion is the strongest predictor of positive affect, but that the other four factors also show meaningful correlations. The meta-analysis by Steel and colleagues seems a more appropriate basis for assessing correlations between the Big Five and subjective well-being, given that it is more recent and uses scales explicitly designed to measure these traits.

Personality and Psychological Well-being

Estimates of correlations between the Big Five and psychological well-being are based on only a few empirical studies. These studies have found that correlations between personality and psychological well-being differ from those found with subjective well-being. Schmutte and Ryff (1997) examined the relationship between personality and psychological well-being, controlling for source and measurement overlap in the affective and evaluative content of items. In contrast to studies of subjective well-being, which have emphasized extraversion and neuroticism, they found that psychological well-being was linked to all of the Big Five factors. Furthermore, the pattern of correlations differed across the psychological well-being dimensions. Consistent with the subjective well-being literature, extraversion and neuroticism emerged as major correlates of psychological well-being. However, conscientiousness, agreeableness, and openness were also important correlates. In particular, large correlations were observed between conscientiousness and purpose in life, agreeableness and positive relations, and openness and personal growth. Table 1 summarizes the correlations reported in Schmutte and Ryff (1997). Overall, the correlations suggest that psychological well-being is more strongly

TABLE 1
Correlation Estimates From the Literature: Big Five With Subjective and Psychological Well-being

Factor	Source	N	E	O	A	C	*r*
Positive Affect	Steel, Schmidt, & Shultz (2008)[a]	–.30	.44	.20	.12	.27	.27
Positive Affect	DeNeve & Cooper (1998)	–.14	.20	.14	.17	.14	.16
Negative Affect	Steel, Schmidt, & Shultz (2008)[a]	.54	–.18	–.02	–.20	–.20	.23
Negative Affect	DeNeve & Cooper (1998)	.23	–.07	.05	–.13	–.10	.12
Life Satisfaction	Steel, Schmidt, & Shultz (2008)[a]	–.38	.28	.03	.14	.22	.21
Life Satisfaction	DeNeve & Cooper (1998)	–.24	.17	.14	.16	.22	.19
Purpose in Life	Schmutte & Ryff (1997)[b]	–.54	.38	.16	.28	.54	.38
Personal Growth	Schmutte & Ryff (1997)[b]	–.20	.43	.42	.32	.31	.34
Positive Relations	Schmutte & Ryff (1997)[b]	–.45	.44	.06	.52	.38	.37
Autonomy	Schmutte & Ryff (1997)[b]	–.48	.24	.17	.14	.39	.28

Note.—Correlation *r* is average absolute *r*; N = Neuroticism, E = Extraversion, O = Openness, A = Agreeableness, C = Conscientiousness. [a]Meta-analysis using NEO only; [b]Correlations obtained using self-report measures ($N = 215$).

related to the Big Five factors than is subjective well-being. Schmutte and Ryff (1997) concluded that the relationship between personality and well-being is more complex than studies of subjective well-being have suggested and that the attainment of well-being is not limited to the "extraverted and non-neurotic". Nonetheless, there is a need to expand the number of studies reporting correlations between personality and psychological well-being in order to refine the estimates and assess the relationship in differing research contexts.

Siegler and Brummett (2000) conducted a detailed analysis of the relationship between personality and psychological well-being in a sample of 2,379 middle-aged adults, focusing on the facets within each Big Five domain. Measures from the University of North Carolina Alumni Heart Study were used to approximate Ryff's psychological well-being scales (1989). Focusing on the dimensions of interest in the current study, positive relations was positively related to all facets of extraversion ($r = .10$ to .25) and openness ($r = .07$ to .15), except excitement seeking and values, respectively, and negatively related to all facets of neuroticism ($r = –.13$ to –.20), except impulsiveness. In addition, positive relations correlated positively with the conscientiousness facets of achievement striving, competence, and self-discipline ($r = .08$ to .17) and the agreeableness facets of altruism, tender-mindedness, and trust ($r = .07$ to .17). Purpose in life showed a stronger association with the facets overall, correlating positively with all facets of extraversion ($r = .07$ to .34) and conscientiousness ($r = .09$ to .27) and negatively with all facets of neuroticism ($r = –.12$ to –.43). In addition, purpose in life was positively associated with the agreeableness facets of altruism, compliance, and trust ($r = .12$ to .26). Measures of autonomy and personal growth were not available.

The relationship between the Big Five and psychological well-being has also been explored in factor analytic studies. Compton (1998) performed a principal components analysis of mental health scales and the Big Five and found that autonomy and self-actualization scales formed a factor separate from the Big Five. Compton concluded that some mental health constructs may be distinct from the Big Five. Van Dierendonck (2005) conducted a second order factor analysis of the Big Five, the Ryff (1989) scales, and measures of happiness, self-esteem, spiritual well-being, and vitality. Results suggested four underlying dimensions of positive psychological health: subjective well-being, self-actualization, interpersonal relations, and autonomy. The subjective well-being factor included positive loadings for all the well-being scales except the spiritual well-being scales and a negative loading for neuroticism. The self-actualization factor consisted of positive loadings for personal growth, purpose in life, spiritual well-being, and conscientiousness. The interpersonal relations factor included positive loadings for positive relations, extraversion, and agreeableness. The final factor, autonomy, included positive loadings for autonomy and openness.

Other studies have examined the interaction and combined effects of the Big Five on psychological well-being. Keyes, *et al*. (2002) examined the relationship of Big Five to high-low combinations of subjective and psychological well-being. They argued that personality should contribute to the psychological differentiation of different well-being types. In support of this hypothesis, they found that people who were low on both subjective and psychological well-being had the highest average for neuroticism and the lowest average for extraversion and conscientiousness. In contrast, those who were high on both subjective and psychological well-being demonstrated the opposite trait profile. Openness distinguished between types with high psychological well-being but low subjective well-being, and types with low psychological well-being but high subjective well-being. More recently, Bardi and Ryff (2007) examined the relationship between the Big Five and psychological well-being following relocation. Neuroticism predicted lower postmove autonomy ($\beta = -.13$), personal growth ($\beta = -.09$), positive relations ($\beta = -.09$), and purpose in life ($\beta = -.12$). In addition, participants who were low on neuroticism and high on openness reported higher personal growth late in the adjustment process.

Studies not situated within the Five Factor Model have reported associations between psychological well-being and other variables including perfectionism and work personality. Chang (2006) found that self-oriented perfectionism, which is likely to overlap with conscientiousness, was positively related to personal growth and purpose in life. More recently,

Strauser, Lustig, and Ciftci (2008) examined the relationship between psychological well-being and the Developmental Work Personality Scale. The scale measures peer/supervisor relations, timeliness, and on-task behavior, which might be expected to overlap with the domains of extraversion and conscientiousness. They found that this scale correlated .35 with autonomy, .21 with personal growth, .35 with positive relations, and .43 with purpose in life.

Taken together, previous research suggests that all of the Big Five are related to psychological well-being. Furthermore, particular pairs of personality and psychological well-being variables have larger or more consistent correlations than other pairs: extraversion with positive relations, conscientiousness with personal growth and purpose in life, and openness with personal growth. From a theoretical standpoint, extraversion and agreeableness may facilitate positive relations through sociable behavior, conscientiousness may facilitate personal growth and purpose in life through task-oriented behavior, and openness may facilitate personal growth through experience seeking. In contrast, agreeableness might be expected to inhibit autonomy.

Modeling Personality and Subjective and Psychological Well-being

In the current study, the relationship between personality and well-being was examined using a structured model comparison. Nested models were compared with the aim of answering the following research questions: (1) Does the size of the relationship between personality and well-being differ for subjective well-being versus psychological well-being? (2) Does the size of the relationship between personality and well-being differ for particular personality traits? (3) Does the relationship between particular personality traits and well-being differ for subjective well-being versus psychological well-being? (4) Given a particular personality trait (e.g., neuroticism), is the relationship between that trait larger for some well-being dimensions (e.g., negative affect) than for other well-being dimensions? That is, is the relationship larger than the *average* personality-well-being relationship for that trait? With regard to Question 4, it was hypothesized that neuroticism would show a larger than average relationship with negative affect; extraversion would show a larger than average relationship with positive affect and positive relations; conscientiousness would show a larger than average relationship with personal growth and purpose in life; agreeableness would show a larger than average relationship with autonomy and positive relations; and openness would show a larger than average relationship with personal growth.

Method

The data were obtained as part of a larger study that examined the

relationship between personality and occupational health and well-being (see Grant & Langan-Fox, 2006; Langan-Fox & Grant, 2006; Grant & Langan-Fox, 2007). Data were collected on demographics, personality, stressor exposure, coping, health, and well-being.[2] The current study focuses on a subset of the variables from this data set. For this study, only the Big Five and subjective and psychological well-being measures are reported. This subset of the data has not been analyzed or reported previously.

Participants

The sample consisted of 88 male and 123 female middle managers employed by a leading Australian department store. The sample was drawn from 41 stores in a 50-store target group, selected at the discretion of the organization, in four states predominantly located along the Eastern Seaboard of Australia. Nine stores declined to participate. Participants were recruited via an in-house advertisement. Participation was voluntary, and there was no compensation. The proportion of the management team within each store that participated varied due to availability on the day of data collection and stated preference regarding participation. The average within-store participation rate was 62%, with the sample representing approximately 60% of the total managerial population in the 41 participating stores. The age range of participants was 20 to 61 years ($M = 35.9$ yr., $SD = 9.2$).

Measures

Personality.—The Big Five traits were measured using the NEO-Five Factor Inventory (NEO-FFI) Form S (Costa & McCrae, 1992), an abridged, 60-item version of the NEO Personality Inventory–Revised, with 12 items per subscale. Participants rated their agreement with a series of statements on a 5-point scale, with anchors 1: Strongly disagree and 5: Strongly agree. Sample items include: "I like to have a lot of people around me" (Extraver-

[2]The full questionnaire battery consisted of a demographic information questionnaire; the Positive and Negative Affectivity Schedule with "past few weeks" time instructions (Watson, *et al.*, 1988); the Thematic Apperception Test (McClelland, 1985; Smith, 1992); the Social Readjustment Rating Scale (Holmes & Rahe, 1967); the Daily Hassles and Uplifts Scale (DeLongis, Folkman, & Lazarus, 1988); social support scales (adapted from Caplan, Cobb, French, van Harrison, & Pinneau, 1980); the Scales of Psychological Well-being (SPWB; Ryff, 1989); the Positive and Negative Affectivity Schedule with "general" time instructions; motive self-ratings (locally developed); the NEO-Five Factor Inventory Form S (Costa & McCrae, 1992); the Work Locus of Control Scale (Spector, 1988); the Revised Jenkins Activity Survey (Spence, Helmreich, & Pred, 1987); the Life Orientation Test–Revised (Scheier, Carver, & Bridges, 1994); measures of goals and goal attributes (locally developed); the Satisfaction With Life Scale (Diener, *et al.*, 1985); the Achievement and Affiliation subscales of the Jackson Personality Research Form E (Jackson, 1984); the Personal Reactions Index (Bennett, 1988); the Occupational Stress Indicator (OSI) Mental Health, Physical Health, and Job Satisfaction Scales (Cooper, Sloan, & Williams, 1988); Measures of Subjective Work Environment Stress (Caplan, *et al.*, 1980); measures of stress (locally developed); and the Brief COPE Inventory (Carver, 1997), completed in that order.

sion subscale); "I often feel inferior to others" (Neuroticism subscale); "I'm pretty good at pacing myself so as to get things done on time" (Conscientiousness subscale); "I often get into arguments with my family and co-workers" [reverse scored] (Agreeableness subscale); and "I am intrigued by the patterns I find in art and nature" (Openness subscale).

The NEO-FFI is one of the most widely used measures of the Big Five dimensions and has excellent internal consistency, temporal stability, and construct validity (see Costa & McCrae, 1992). Costa and McCrae (1992) reported internal consistency reliabilities (Cronbach coefficients alpha) of .77, .86, .81, .68, and .73 for the scales Extraversion, Neuroticism, Conscientiousness, Agreeableness, and Openness, respectively. Item ratings were rescored as follows: $1 \rightarrow 0$, $2 \rightarrow 1$, $3 \rightarrow 2$, $4 \rightarrow 3$, $5 \rightarrow 4$. Subscale scores were obtained by reverse-scoring applicable items and then summing the item scores for a given subscale and dividing by 12. Thus, the possible range of scores for each subscale is 0 to 4.

Subjective well-being.—Positive and negative affect were measured using the Positive and Negative Affectivity Schedule (PANAS) with "past few weeks" time instructions (Watson, Clark, & Tellegen, 1988). The PANAS is presented in the form of a 20-item adjective checklist. Examples of the negative affect subscale items are: "depressed", "upset", and "guilty". Examples of the positive affect subscale items are: "interested", "excited", and "strong". Participants rated the extent to which each adjective described how they had felt during the past few weeks using the following scale: 1: Very slightly or not at all, 2: A little, 3: Moderately, 4: Quite a bit, and 5: Extremely. Subscale scores were obtained by averaging the item scores for a given subscale. Thus, the possible range of scores for each subscale is 1 to 5.

Watson, *et al*. (1988) noted that the reliability of the PANAS is unaffected by the time-frame used e.g., "how you feel in general", "how you feel at the moment", "how you felt during the past few weeks". They found that internal consistency reliabilities (Cronbach alpha) were within an acceptable range for both Positive Affect, .86 to .90, and Negative Affect, .84 to .87. In addition, they reported a low, negative correlation between Positive Affect and Negative Affect, regardless of the time frame used, with each adjective loading at .50 or above on the appropriate factor, thus supporting the factorial validity of the measure. There is sound evidence for the external validity of the PANAS, with Positive Affect and Negative Affect correlating significantly and predictably with the Hopkins Symptom Checklist, the Beck Depression Inventory, and the State-Trait Anxiety Inventory (Watson, *et al.*, 1988).

Life satisfaction.—The five-item Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) was used. Participants rated their agree-

ment with a series of statements on a 7-point scale, with anchors 1: Strongly disagree and 7: Strongly agree. A sample item is: "In most ways my life is close to my ideal". The overall score for life satisfaction was obtained by averaging the ratings provided for each item in the scale. Thus, the possible score range was 1 to 7. Diener, *et al*. (1985) reported a coefficient alpha of .87 for the scale. In addition, all items loaded at .61 or above, with item-total correlations ranging from .57 to .75, and a single factor accounting for 66% of the variance. Diener, *et al*. (1985) found that the scale correlated significantly and predictably with self-esteem, neuroticism, emotionality, activity, sociability, impulsivity, and a symptom checklist, and was uncontaminated by social desirability.

Psychological well-being.—Autonomy, personal growth, positive relations, and purpose in life were measured via an abridged, 36-item version of the Scales of Psychological Well-being (Ryff, 1989), with nine items per subscale. While the original version consists of 20 items per subscale, the shortened version was used in the current study to minimize the burden on participants in an already lengthy questionnaire battery. Participants rated their agreement with a series of statements on a 6-point scale, with anchors 1: Strongly disagree and 6: Strongly agree. Sample items include: "I am not afraid to voice my opinions, even when they are in opposition to the opinions of most other people" (Autonomy subscale); "I am not interested in activities that will expand my horizons" [reverse scored] (Personal Growth subscale); "Most people see me as loving and affectionate" (Positive Relations subscale); and "I live life one day at a time and don't really think about the future" [reverse scored] (Purpose in Life subscale). Subscale scores were obtained by reverse scoring applicable items and then averaging the item scores for a given subscale. Thus, the possible range of scores for each subscale is 1 to 6.

The 9-item scales are being employed as part of a longitudinal study being carried out by Ryff, therefore full details regarding the psychometric properties of the scales are not currently available. Van Dierendonck (2005) compared the psychometric properties of the 3-, 9- and 14-item subscales across two studies. Internal consistencies for the 9-item scales for the two studies were as follows: autonomy, .78 and .69; environmental mastery, .77 and .71; personal growth, .65 and .69; positive relations, .77 for both studies; purpose in life, .73 and .65; and self-acceptance, .83 and .61. Ryff and Singer (2006) noted that Van Dierendonck's findings (2005) are perplexing: internal consistencies were acceptable for the 9-item and 14-item scales but not the 3-item scales, and construct validity was acceptable for the 3-item scales but not the longer scales. They pointed out that several confirmatory factor analyses of the scales have supported the theory-guided 6-factor model, thus confirming its construct validity. Bio-

logical, psychological, and sociodemographic correlates also support the distinctiveness among the six scales (see Ryff & Singer, 2006, 2008). The psychometric properties of the scales within the context of the current study are reported in the Results section below.

Procedure

Data collection was conducted on a group basis over a 1- to 3-day period within each state. Data collection sessions were conducted by the first or second author or a postgraduate research assistant. All measures were administered according to standardized, published instructions and completed using paper and pencil. Participants completed the measures over a 2-hr. period at a centralized location such as a conference room. Participants unable to attend a group session were visited at their workplaces and completed the measures under the supervision of the researcher. Data collection for the different states was scheduled as close together as possible to ensure that there was no "history" effect. The study was conducted in accordance with the principles for the ethical treatment of human subjects as approved by the University of Melbourne Human Research Ethics Committee. Prior to the commencement of data collection, participants were provided with an outline of the study in plain language, which was read aloud by the researcher and provided in writing. Those who wished to participate then signed a consent form. It was emphasized that all data provided would be anonymous and confidential, and that results would be reported on an aggregated basis only.

Results

Preliminary Analyses

Data screening.—Initial data screening revealed minimal missing data. A small number of participants (<5%) omitted the occasional item. Values for these missing items were estimated by taking the average of the remaining items in the applicable subscale and substituting this score. Intraclass correlation coefficients (see Snijders & Bosker, 1999) indicated that there was no "store effect" in the data, confirming that it could be pooled across stores without violating the assumption of independence of observations.

The presence of outliers was assessed by examining Mahalanobis' Distance on the three Subjective Well-being scales and the four Psychological Well-being scales. Raw data for cases with the most extreme values of Mahalanobis' Distance were examined. Cases identified using this process tended to score high on Neuroticism and Negative Affect and lower on the remaining well-being variables. These cases were not deleted for two reasons. First, removal of the five cases with the largest Mahalanobis' Distance values had almost no effect on the resulting correlation matrix.

Second, the well-being scales used are typically skewed, with most participants reporting that well-being varies between "slightly satisfied" and "very satisfied" (Diener, Suh, Lucas, & Smith, 1999, p. 286).

Factor analysis of Personality and Well-being Scales.—An exploratory factor analysis using Maximum Likelihood Extraction, Promax rotation, and extracting five factors supported the theorized factor structure of the NEO-FFI. Fifty-seven of 60 items loaded highest on the theorized scales.

An exploratory factor analysis using Maximum Likelihood Extraction, Promax rotation on the Positive and Negative Affect items, Life Satisfaction items, and items from the four Psychological Well-being scales supported the theorized grouping of the items, particularly for the Positive and Negative Affect and Satisfaction With Life scales. When eight factors were extracted, positive relations items were split into two items sets; one focused on having friends and positive relationships, the other focused on others perceiving oneself as a good person. When extracting eight factors, only three of 61 items did not load maximally on the desired grouping. Note that when seven factors were extracted, Personal Growth and Purpose in Life items loaded on the same factor. Given the good convergence with theorized loadings and the aim of making the data comparable with prior research, all Subjective Well-being and Psychological Well-being subscales were computed using all original items.

An exploratory factor analysis did not support the split of scales into Subjective Well-being and Psychological Well-being scales. Nonetheless on theoretical grounds, analyses focused on comparing the relationship between personality and well-being across the two broad types of well-being dimensions.

Descriptive Statistics and Correlations

Descriptive statistics and correlations between age, sex, personality, and well-being variables are shown in Table 2. Negative Affect was positively skewed, reflecting the fact that most people do not report much negative affectivity. Although an inverse transformation would have made the variable more normally distributed, data analysis was performed on the original variable because correlations with the other scales were not substantially changed by transformation and the original scale preserves the meaning of the scale's metric. All factors except for Agreeableness had internal consistency reliabilities above .70.[3]

[3]To check for nonlinear relationships between age and other variables, the ΔR^2 of entering the square root of age (i.e., a quadratic effect) as a predictor over and above entering age (i.e., a linear effect) on its own was examined. Although it would not be statistically significant if a Bonferroni correction was made for the 12 scales on which the analysis was performed, there was a small nonlinear relationship between age and neuroticism [adjusted r^2 (linear) = .007; adjusted r^2 (linear and quadratic) = .011; Δr^2 p = .02]. Examination of the scatter plot suggested a subtle U-shape in the data with participants around the age of 40 having the lowest scores on neuroticism with a tendency to higher scores for participants under 30 and over 50.

TABLE 2

DESCRIPTIVE STATISTICS AND CORRELATIONS

	M	*SD*	α	*r*												
				1	2	3	4	5	6	7	8	9	10	11	12	13
1. Sex																
2. Age, yr.	35.9	9.2		–.01												
Positive and Negative Affectivity Schedule																
3. Positive Affectivity (1–5)	3.48	0.62	.88	.07	.06											
4. Negative Affectivity (1–5)	1.67	0.53	.81	–.12	.00	–.25										
5. Satisfaction with Life (1–7)	4.81	1.25	.88	.09	–.01	.28	–.33									
Scales of Psychological Well-being																
6. Autonomy (1–6)	4.35	0.68	.74	–.07	.01	.17	–.33	.22								
7. Personal Growth (1–6)	5.09	0.60	.75	.13	–.20	.27	–.21	.14	.40							
8. Positive Relations (1–6)	4.84	0.74	.80	.25	–.03	.28	–.34	.34	.21	.34						
9. Purpose in Life (1–6)	4.84	0.68	.74	.18	–.07	.35	–.42	.33	.37	.52	.39					
NEO-Five Factor Inventory																
10. NEO: Extraversion (0–4)	2.65	0.47	.76	.26	–.15	.37	–.22	.22	.15	.43	.48	.33				
11. NEO: Neuroticism (0–4)	1.34	0.59	.84	.07	–.09	–.38	.56	–.36	–.56	–.32	–.39	–.44	–.26			
12. NEO: Conscientiousness (0–4)	2.89	0.48	.81	.10	.11	.33	–.30	.21	.28	.25	.31	.45	.16	–.37		
13. NEO: Agreeableness (0–4)	2.81	0.40	.67	.25	.05	.12	–.23	.16	–.07	.05	.20	.11	.24	–.26	.21	
14. NEO: Openness (0–4)	2.31	0.52	.72	.11	–.14	.06	.03	.04	.13	.40	.15	.08	.22	–.06	–.05	–.03

Note.—$N = 211$; $r > |.14|$ are significant at $\alpha = .05$; $r > |.18|$ are significant at $\alpha = .01$. Sex is coded such that 0 = male, 1 = female.

In general, the well-being variables showed a moderate, positive correlation with Extraversion and Conscientiousness, and a moderate to strong, negative correlation with Neuroticism. Extraversion correlated more strongly with Positive than Negative Affect, and Neuroticism correlated more strongly with Negative than Positive Affect. The average absolute correlation with Positive and Negative Affect was higher for Neuroticism than for Extraversion. Conscientiousness showed a moderate correlation with both Positive and Negative Affect. Positive and Negative Affect only correlated to a small extent with each other. Neuroticism showed a moderate, negative correlation with Life Satisfaction while Extraversion and Conscientiousness were weakly, positively correlated with this dimension. Agreeableness showed a weak, negative correlation with Negative Affect and a weak, positive correlation with Life Satisfaction. Openness was unrelated to the Subjective Well-being dimensions. Across the psychological well-being dimensions, Extraversion showed larger than average correlations with Personal Growth and Positive Relations. Larger than average correlations were also observed for Neuroticism and Autonomy, Conscientiousness and Personal Growth, Agreeableness and Positive Relations, and Openness and Purpose in Life.

Model Testing

Structural Equation Modeling was conducted on the Big Five traits, the three Subjective Well-being measures, and the four Psychological Well-being measures. Analyses were performed on the individual scales. A sequential model testing approach was adopted, which involved first testing simple models and then progressively incorporating proposed theoretical pathways. The model development and testing process was confirmatory. In assessing model fit, chi square, degrees of freedom, RMSEA, CFI, and SRMR are reported. Hu and Bentler (1999) suggested that models that meet the following criteria are likely to have good fit: CFI > .95, SRMR < .08, and RMSEA < .06. Nested models were compared using the chi-squared difference test.

Table 3 presents the model fit information. The correlation matrix is based on the five personality variables, and the three Subjective and four Psychological Well-being variables. Before computing the correlation matrix, Negative Affect and Neuroticism were reversed. This allowed us to set meaningful equality constraints on the correlation matrix where required (see below), rather than specifying that the relationship for these variables was equal in magnitude but opposite in sign.

Model 1 reports the results for the null model, where the correlations between all variables (i.e., the Big Five, the three Subjective Well-being dimensions and the four Psychological Well-being dimensions) were constrained to zero. In Model 2, the correlations between all variables were

constrained to be equal (the correlation was estimated to be 0.26). Model 2 was a significant improvement over Model 1 ($\chi^2_1 = 413$, $p < .001$). In Model 3, all correlations between the personality variables were free to vary, all correlations between the well-being variables were free to vary, and all correlations between the personality and well-being variables were constrained to be equal. In this model, the correlation between personality and well-being variables was estimated to be .26. While Model 3 was a significant improvement over Model 2 ($\chi^2_{31} = 102$, $p < .001$), the purpose of Model 3 was to provide a frame of reference for assessing subsequent models, focusing on the relationship between personality and well-being.

Model 4 examined the theoretical question of whether the size of the relationship between personality and well-being differs for subjective versus psychological well-being. In Model 4, all correlations between personality variables were free to vary, all correlations between the well-being variables were free to vary, all correlations between the personality and Subjective Well-being variables were constrained to be equal, and all correlations between the personality and Psychological Well-being variables were constrained to be equal. The correlation between personality and subjective well-being was estimated to be .23 and the correlation between personality and psychological well-being was estimated to .28. This model was a significant improvement over Model 3 ($\chi^2_1 = 4.625$, $p = .03$).

Building on Model 3, Model 5 examined the theoretical question of whether the size of the relationship between personality and well-being differed for particular personality traits. In this model, all correlations between the personality variables were free to vary, all correlations between the well-being variables were free to vary and, for a given trait, all correlations between that trait and the well-being variables were constrained to be equal. That is, all correlations between Neuroticism and the seven well-being variables were constrained to be equal, all correlations between Extraversion and the well-being variables were constrained to be equal, and so on for Conscientiousness, Agreeableness, and Openness. The estimated correlations indicated that Neuroticism showed the largest relationship with well-being ($r = .44$), followed by Extraversion ($r = .31$) and Conscientiousness ($r = .29$), and then Openness ($r = .12$) and Agreeableness ($r = .11$). The model resulted in a large and significant improvement in fit relative to Model 3 ($\chi^2_4 = 127$, $p < .001$).

Model 6 addressed the third theoretical question of whether the relationship between particular personality traits and well-being differs for subjective well-being versus psychological well-being. Again, correlations between the personality variables were free to vary and correlations between the well-being variables were free to vary. However, for a given trait, the correlations between the trait and the Subjective Well-being vari-

TABLE 3

Model Fit Statistics For Structural Equation Models

Model	Description	χ^2	*df*	RMSEA (90%*CI*)	CFI	SRMR
1	Null Model: Correlation between all variables constrained to zero.	724.607	78	.199*	.018	.273
2	Correlation between all variables constrained to be equal.	311.813	77	.121*	.643	.131
3	Correlations between personality variables free to vary. Correlations between well-being variables free to vary. Correlations between personality and well-being variables constrained to be equal.	209.809	46	.130*	.751	.113
4	Does the size of the personality-well-being relationship differ for subjective well-being versus psychological well-being? (Nested in Model 3) Correlations between personality variables free to vary. Correlations between well-being variables free to vary. Correlations between personality and subjective well-being variables constrained to be equal. Correlations between personality and psychological well-being variables constrained to be equal.	205.184	45	.130 (112–.149)	.757	.112
5	Does the size of the personality-well-being relationship differ for particular personality traits? (Nested in Model 3) Correlations between personality variables free to vary. Correlations between well-being variables free to vary. For each trait, all correlations between that trait and the well-being variables were constrained to be equal.	126.752	42	.098 (.079–.118)	.871	.07

(continued on next page)

Note.—Negative Affectivity and Neuroticism were reversed; $N = 211$. *No estimates of RMSEA confidence intervals were available for these models.

TABLE 3 (CONT'D)

MODEL FIT STATISTICS FOR STRUCTURAL EQUATION MODELS

Model	Description	χ^2	*df*	RMSEA (90%*CI*)	CFI	SRMR
6	Does the relationship between particular personality traits and well-being differ for subjective well-being versus psychological well-being? (Nested in Model 5) Correlations between personality variables free to vary. Correlations between well-being variables free to vary. For each trait, all correlations between that trait and the subjective well-being variables were constrained to be equal. For each trait, all correlations between that trait and the psychological well-being variables were constrained to be equal.	109.621	37	.097 (.076–.118)	.890	.063
7	For a particular personality trait, is the relationship between that trait and specific well-being dimensions larger than the average personality–well-being relationship for that trait? (Nested in Model 5) Correlations between personality variables free to vary. Correlations between well-being variables free to vary. The following personality and well-being variable correlations were free to vary: Extraversion with Positive Affectivity and Positive Relations, Neuroticism with Negative Affectivity, Conscientiousness with Personal Growth and Purpose in Life, Agreeableness with Autonomy and Positive Relations, Openness with Personal Growth. For each trait, all remaining correlations between that trait and the well-being variables were constrained to be equal.	55.767	34	.055 (.027–.080)	.967	.048

Note.—Negative Affectivity and Neuroticism were reversed; $N = 211$. *No estimates of RMSEA confidence intervals were available for these models.

ables were constrained to be equal, and the correlations between the trait and the Psychological Well-being variables were constrained to be equal, e.g., all correlations between Neuroticism and the Subjective Well-being variables were constrained to be equal and all correlations between Neuroticism and the Psychological Well-being variables were constrained to be equal. Allowing the model to have this additional freedom resulted in a small and statistically significant improvement in fit over Model 5 (χ^2_5 =17, p = .004). The estimated correlations for each trait for Subjective and Psychological Well-being respectively were: Extraversion, rs = .27 and .35; Neuroticism, rs = .44 and .43; Conscientiousness, rs = .26 and .32; Agreeableness, rs = .15 and .07; and Openness, rs = .05 and .18.

Model 7 addressed the final research question of whether particular pairs of personality and well-being variables show larger than average correlations. Model 5 indicates that the size of the relationship between personality and well-being differs for particular personality traits. Model 7 is based on Model 5, but includes eight additional relationships for particular pairs of personality and well-being variables that were theorized to have larger correlations than the average trait–well-being correlations given in Model 5. This model demonstrated a large and statistically significant improvement in fit relative to Model 5 (χ^2_8 = 71, p < .001). Model 7 was also the first model in the set to show good fit statistics, relative to conventional rules of thumb. While Model 7, is not nested within Model 6, it does show substantially superior fit statistics (e.g., CFI = .97 versus .89 for Model 6), while only using three more degrees of freedom. To understand the superior fit of Model 7, it is useful to look at the general and specific well-being correlations for each personality variable: Extraversion (General Well-being, r = .26; Positive Affect, r = .35; Positive Relations, r = .47), Neuroticism (General Well-being, r = .42; Negative Affect r = .55), Conscientiousness (General Well-being, r = .28; Personal Growth, r = .28; Purpose in Life, r = .45), Agreeableness (General Well-being, r = .15; Autonomy, r = –.09; Positive Relations, r = .19), Openness (General Well-being, r =.08; Personal Growth, r = .39). Note that the General Well-being correlations in Model 7 represent the average of all relationships for a given trait excluding those that were free to vary (therefore, these correlations differ slightly from those cited for Model 5). Six of the eight theorized correlations differed from the relationship between the personality trait and the General Well-being dimension in the hypothesized direction. The exceptions were Conscientiousness and Personal Growth, and Agreeableness and Autonomy.

Discussion

Despite considerable interest in the personality traits that predict

subjective well-being, parallel research on psychological well-being has been scarce. This is problematic given the multifaceted nature of well-being and the possibility that different well-being dimensions may correlate with different traits. Accordingly, the current research investigated the relationship between the Big Five and dimensions of both subjective well-being (positive affect, negative affect, satisfaction with life) and psychological well-being (autonomy, personal growth, positive relations, purpose in life).

The broad research question involved whether personality relates to subjective well-being and psychological well-being to the same extent and in the same manner. To address this question, the size of relationships were compared for (1) personality and well-being for subjective versus psychological well-being, (2) personality and well-being for different personality traits, and (3) personality and subjective well-being with the size of the relationship between personality and psychological well-being for particular personality traits. Finally, (4) pair-wise relationships between particular traits and well-being dimensions were examined.

Considering all personality traits and all well-being dimensions together, the overall relationship between personality and well-being was larger for psychological well-being than for subjective well-being. The overall relationship between personality and psychological well-being was moderate, suggesting that at a general level a dispositional model is a better fit for this aspect of well-being than for subjective well-being. However, an alternative explanation for these findings can be found in the contrasting format of subjective and psychological well-being measures. As observed by Steel, *et al*. (2008), subjective well-being measures require respondents to relate item content to varying time frames. For example, the affective component of subjective well-being, measured with the PANAS (Watson, *et al*., 1988), concerns emotions experienced in recent weeks or months, thus representing a state. On the other hand, the cognitive component of subjective well-being, measured with Diener, *et al*.'s scale (1985), concerns long-term appraisal (e.g., "If I could live my life over, I would change almost nothing"). In contrast, all components of psychological well-being, measured with the Scales of Psychological Well-being (Ryff, 1989), concern general or long-term appraisal (e.g., "When I think about it, I haven't really improved much as a person over the years"). All else being equal, scales that concern appraisal over a longer time frame should be more stable over time and should thus correlate more strongly with personality at a general level.

Considering the Big Five traits individually, Neuroticism showed a similar relationship to Subjective Well-being and Psychological Well-being, Agreeableness showed a stronger relationship with Subjective Well-

being than with Psychological Well-being, and Openness showed a stronger relationship with Psychological Well-being than with Subjective Well-being. Extraversion and Conscientiousness showed a slightly stronger relationship with Psychological Well-being. Taken together, these findings imply a more complex picture of the relationship of personality and well-being. For three of the Big Five scales—Extraversion, Neuroticism, and Conscientiousness—relationships with Subjective versus Psychological Well-being were not very different, suggesting that these traits represent personality predispositions for a general level of well-being. Neuroticism was the strongest correlate for both aspects of well-being, with almost identical correlations. Extraversion and Conscientiousness shared highly similar correlations for both Subjective Well-being (.27 and .26, respectively) and Psychological Well-being (.35 and .32, respectively), with the latter being slightly stronger. All three trait measures were moderately correlated with Subjective and Psychological Well-being. An examination of the overall relationship between the personality trait measures and well-being revealed that Neuroticism had the largest relationship with well-being, followed by Extraversion, Conscientiousness, Openness, and Agreeableness, in that order.

Examination of the pair-wise relationships between particular personality traits and well-being dimensions contributed information over and above that obtained from modeling relationships between general personality traits and well-being. As expected, positive affect and negative affect showed larger than average correlations with Extraversion and Neuroticism, respectively; Personal Growth showed a larger than average correlation with Openness; positive relations showed larger than average correlations with Extraversion and Agreeableness; and Purpose in Life showed larger than average correlations with Conscientiousness. Contrary to predictions, relationships between Autonomy and Agreeableness and Personal Growth and Conscientiousness were not larger than average. Modeling the relationship between personality and well-being in this way resulted in superior model fit, suggesting that the relationship between personality and well-being is best modeled at the level of associations between individual traits and well-being dimensions. In other words, the results suggest that the key dispositional influences on well-being vary, depending on the well-being dimension.

An alternative explanation is that some of these relationships reflect construct overlap. According to Diener and Lucas (1999), to argue that negative affect and neuroticism are correlated is tautological, as these variables essentially represent the same concept. In a similar vein, Hills and Argyle (2001) found that the pattern of correlations between extraversion, neuroticism, and conscientiousness and the Depression–Happi-

ness Scale, the Oxford Happiness Inventory, and the Satisfaction With Life Scale seemed to reflect construct overlap. Neuroticism was consistently related to subjective well-being, but also was strongly related to depression. In contrast, conscientiousness was related to life satisfaction, while well-being measures that included sociability items showed stronger correlations with extraversion. One might also expect to find construct overlap between certain items on the Scales of Psychological Well-being and the Big Five. For example, the purpose in life item "I am an active person in carrying out the plans I set for myself" strongly resembles NEO-FFI items from the conscientiousness domain. Likewise, some agreeableness and positive relations items and some openness and personal growth items are comparable (Van Dierendonck, 2005).

In summary, the current study suggests there are similarities and differences in the relationship between personality and well-being across subjective and psychological well-being dimensions. Overall, the relationship was stronger for psychological well-being than for subjective well-being. Extraversion, neuroticism, and conscientiousness related similarly to subjective and psychological well-being. Agreeableness showed a stronger relationship with subjective well-being, while openness showed a stronger relationship with psychological well-being. These results echo Schmutte and Ryff's argument (1997) that the assumption that well-being is only accessible to the "non-neurotic and extraverted" is an oversimplification. The personality correlates of the dimensions within each broad type of well-being varied, suggesting that the relationship of personality and well-being is best modeled in terms of specific associations among traits and well-being dimensions.

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