

Exploring the Associations Between Personality and Subjective Well-Being

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Abstract:

Decades worth of research on subjective well-being provides evidence for the idea that personality plays a strong role reports of positive affect, negative affect, and life satisfaction. Specifically, this research shows that subjective well-being, like personality traits themselves, is moderately stable over time and moderately heritable. In addition, some of the strongest correlates of well-being reports are personality traits like extraversion and neuroticism. In this chapter, I review evidence for the importance of personality in explaining subjective well-being, focusing both on the strengths and limitations of existing research and complexities in the interpretation of the empirical evidence that does exist. Ultimately, research on personality and well-being can be seen as a model for how research on other predictors of subjective well-being can proceed.

Keywords: Personality, Subjective Well-Being, Stability

Subjective well-being (SWB) reflects a person's overall evaluation of the quality of his or her life as a whole. Presumably, when constructing life satisfaction judgments, people consider the various events and circumstances in their lives (e.g., their income, their social relationships, their health, and the various positive and negative life events that have occurred), weight these circumstances by importance, and then aggregate to derive an overall evaluation. If this intuitive model of how SWB judgments are made is correct, then one might expect the objective circumstances in one's life to be the primary determinant of his or her SWB. Furthermore, people's behaviors are often guided by their beliefs about what external circumstances will make them happy (Gilbert, 2006). Thus, psychologists and lay people alike often express surprise about the relatively weak associations between specific external life circumstances and well-being judgments (e.g., Gilovich & Eibach, 2001; Kahneman, 1999; Schwarz & Strack, 1999).

In contrast to the relatively small associations with life circumstances, decades of research show that the strongest and most consistent predictors of SWB are typically the stable individual differences that personality psychologists study (Diener, Suh, Lucas, & Smith, 1999; Lucas & Diener, 2015; Steel, Schmidt, & Shultz, 2008). For instance, although research typically shows correlations around .20 between SWB and intuitively appealing predictors like income (R. T. Howell & Howell, 2008; Lucas & Dyrenforth, 2006; Lucas & Schimmack, 2009), correlations with personality traits like extraversion and neuroticism are often around .40 or .50 (Lucas & Fujita, 2000; Steel et al., 2008).

Indeed, the strong evidence for the stability and heritability of SWB, along with the relatively strong associations between scores on SWB measures and various personality traits, have led some to suggest that well-being judgments themselves are trait-like and may even be impervious to lasting effects of changing external circumstances (Brickman & Campbell, 1971; Headey & Wearing, 1991; Lykken & Tellegen, 1996). Clearly, if SWB were so strongly determined by personality that external circumstances simply do not matter, then this would have serious implications for research on SWB. Specifically, it would suggest that the search for external predictors of the construct would ultimately be fruitless. Perhaps more importantly, it would suggest that striving for improved well-being may be impossible, as personality processes would inevitably return people to their genetically determined set points. In this chapter, I review the evidence for the role that personality processes play in SWB, focusing on what we know about the links

between personality and well-being and what this means for our understanding of the role of external circumstances for SWB.

Evidence for the Importance of Personality

Before addressing the role that personality plays in SWB judgments, it is important to define the construct itself. As noted above, I start with the idea that SWB reflects a person's overall evaluation of the quality of life as a whole (see Diener, Lucas, Schimmack, & Helliwell, 2009, for a more detailed discussion). Researchers who study SWB acknowledge that such evaluations can be assessed in a variety of ways. For instance, Diener (1984) noted that there are at least two ways to evaluate SWB. First, one can simply ask respondents to think about the features of their lives and to provide an overall rating of their satisfaction with these conditions. Measures of life satisfaction or domain satisfaction assess this more *cognitive* approach to the evaluation of well-being. Alternatively, if one's life is going well, it is reasonable to assume that that person would experience frequent positive emotions and infrequent negative emotions; and thus, it is possible to use respondents' typical levels of affective experience as an indicator of how well their lives are going (see Busseri & Sadava, 2011; Schimmack, 2008, for a discussion of these multi-component models of SWB).

It is also important to note that even for the same component of SWB, there are multiple ways to obtain an assessment of the underlying construct. For instance, Kahneman and Riis (2005) noted that if we want to assess the typical level of positive affect that a person experiences, researchers could either ask respondents to reflect on their lives and report their typical experiences or they could assess these momentary experiences using more intensive procedures such as ecological momentary assessment (Stone, Shiffman, & DeVries, 1999) or the day reconstruction method (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004). The various components of SWB and even the various measures of the same component can show differential associations with predictors and outcomes, and thus, it is important to consider when and why these various measures behave the same or differently. Thus, when possible, I will discuss how personality differentially relates to different measures.

As reviewed elsewhere (Lucas & Diener, 2008, 2015), there are at least three main lines of evidence that suggest that personality matters for SWB. First, SWB measures, like personality traits themselves, are stable over time. Specifically, people exhibit *rank-order stability*, where those who are relatively happy at one moment tend to be happier than average when assessed at a later time. Second, SWB is moderately heritable, which suggests that something inside the person plays a role in the well-being that people report. And finally (and most directly), SWB measures tend to be moderately strongly correlated with scores on personality traits. Below I review some of the primary findings for each line of evidence.

The Stability of SWB

The importance of research on the stability of SWB is nicely summarized in a quote from an early article by Costa, McCrae, and Zonderman (1987). They noted that the evidence for high levels of stability that they found in their study "[points] out the need for caution in interpreting well-being scores as indices of the quality of life, because well-being is strongly influenced by enduring characteristics of the individual" (p. 299). In other words, if we assume that the circumstances of one's life change over time, then evidence for strong stability means that these changing circumstances have little effect on SWB, and that something internal to the person must be the primary determinant of individual differences in this construct.

The article by Costa et al. (1987) is useful in highlighting some of the issues involved when considering research on the stability of SWB. First, this early study, which used high quality data to examine the test-retest stability of SWB, clearly shows that responses to SWB measures are stable over a reasonably long period time. Specifically, in this 10-year longitudinal study, which included a nationally representative sample of the United States with thousands of participants, the stabilities of positive and negative affect were .44 and .43, respectively. As Costa et al. (1987) emphasized, these relatively high stability coefficients contrast with the relatively weak correlations with demographic factors like income or age. Furthermore, they showed that the correlations are equally strong for those who went through major life transitions like a change in employment or marital status and those who did not. Thus it appears to provide strong evidence that SWB judgments are impressively stable over time.

Although the early study by Costa et al. (1987) provides important evidence for the long-term stability of SWB, there are a number of limitations that would need to be addressed by subsequent research. First, the study used a simple two-wave design that results in just a single stability coefficient. This single stability coefficient is difficult to interpret (Fraley & Roberts, 2005; Kenny & Zautra, 1995, 2001): Would

stability coefficients decrease with longer intervals, or do they remain impressively strong even over many decades? Multi-wave studies can be used to assess the pattern of stability coefficients across varying intervals, which provides clearer answers to the questions about the role of stable internal factors in determining SWB.

Second, the study relies solely on global, self-report measures of SWB, and specifically on self-report measures of the affective components of SWB. This limitation leaves open a number of questions: How stable are other components, such as life satisfaction; how stable are non-self-report measures of SWB; how much of the stability is due to the shared method variance that results from the reliance on a single method or to stability in method factors such as response styles?

Finally, although Costa et al. acknowledge that stability in SWB could either be due to the influence of personality or to the fact that important life circumstances tend to be stable over time, their methods for dealing with this ambiguity (which focused on assessing stability separately among people who experienced a major life event versus those who did not) were quite limited. Thus, the question of whether SWB can change after the experience of life events is mainly left unanswered by studies like this. Over the subsequent decades, answers to these questions became much more clear.

More recent attempts to investigate the stability of well-being measures have led to clearer conclusions about the degree of stability that exists. Specifically, more recent studies have used long-running panel studies or meta-analytic summaries from studies that vary in interval length to derive more precise estimates of how stability coefficients change with increasingly long intervals and across different types of measures (see Sheldon & Lucas, 2014, for an overview of issues related to the stability of SWB). To clarify why these multi-wave studies are necessary, it is useful to discuss the conceptual underpinnings of one model for analyzing multi-wave data, the Stable Trait-Autoregressive Trait-State (STARTS) model (Kenny & Zautra, 1995, 2001).

The idea behind the STARTS model is that at any given occasion, there are three types of influences that could affect responses to a measure. First, there are perfectly stable influences, those that impact responses in the same way no matter the occasion. These can be considered *stable trait* influences. Second, there are completely unstable influences that affect responses at one wave, but are completely independent from responses at any other wave. These can be considered *state* influences.¹ Finally, it is possible to identify the influence of characteristics that change systematically over time in an autoregressive manner. For instance, factors whose influence wanes with increasing time will lead to stronger correlations over shorter intervals, and weaker correlations over longer intervals. These influences are reflected in an *autoregressive trait* component.

Kenny and Zautra (1995) noted that each component implies a different pattern of stability coefficients over time (also see Fraley & Roberts, 2005). For example, if responses to life satisfaction were due entirely to the effects of unstable state influences, then responses should be completely uncorrelated over time. In contrast, if life satisfaction judgments were due entirely to the influence of stable-trait factors, then stability coefficients would equal one, no matter the interval that was chosen. Finally, if life satisfaction ratings were due entirely to autoregressive factors, then stability coefficients should decline as the length of the interval increased. Specifically, these coefficients should show an exponential decline. For example, if the one-year stability was .75, then the two-year stability would be 0.56 (i.e., $.75^2$) and the three-year stability would be 0.42 (i.e., $.75^3$).

Of course, if all three sources of variance contribute to a person's score on a well-being measure, then the pattern of correlations will not fall into one of these three ideal patterns. However, structural equation modeling techniques can be used to decompose the pattern of correlations and to estimate the amount of variance accounted for by the three sources. For instance, if a measure of SWB was influenced equally by transient state influences, autoregressive trait influences, and stable trait influences, then the correlation between two waves that were very close in time would be .66 (reflecting the fact that one-third of the variance was completely transient), the correlation between two waves that were very distant would be .33 (reflecting the constant effect of the perfectly stable trait), and the correlation between waves of increasing intervals would decline in a regular fashion (due to the impact of the slowly changing autoregressive trait; the precise rate of decline would then depend on the wave-to-wave stability of this autoregressive component).

Lucas and Donnellan (2007) and Lucas and Donnellan (2012) used these techniques with data from four different long-running panel studies, including the German SocioEconomic Panel Study, the British Household Panel Study, and the Household Income and Labour Dynamics in Australia study. Results showed that approximately one-third of the variance was pure state variance (including measurement error), one-quarter to one-third of the variance was purely stable trait variance, and approximately one-third

of the variance was moderately stable autoregressive variance. This leads to the expectation that year-to-year stability will be about .60, stability coefficients will initially decline with increasing length of interval (e.g., over interval lengths from 2 to 10 years), but that stabilities will eventually asymptote at around .25 to .30, where they will remain even as interval lengths continue to increase. This pattern of results supports the idea that there is a core, trait-like aspect to SWB judgments, but that this component accounts for only a modest percentage of the variability in SWB judgments.

Complex analyses like this help address the ambiguities of early, two-wave longitudinal studies like the one by Costa et al. (1987) described above because they can provide information about the causes of the stability that is observed. For instance, the results from Lucas and Donnellan (2012) suggest that the one-year stability will be considerably higher than the 20-year stability because the former is a result of both the influence of a stable trait and slowly changing factors that lead to high stability over shorter intervals. However, this slowly changing factors could be due to changes in personality or to external factors. Further increases in complexity of design can help clarify these additional issues. For instance, Schimmack and Lucas (2010) expanded the use of latent state-trait models to incorporate information from couples who were followed over time. This allowed them to examine how two members of a couple change in similar or different ways over time. If, after accounting for initial similarity, two members of a couple change in similar ways, then it suggests that shared environmental experiences are driving this change. In addition, the models they used allowed them to test how much of the variance can ultimately be explained by these external influences (though see the paper itself for some caveats about the strength of conclusions that can be drawn). Their results suggested that sizable component of the variance in life satisfaction judgments is due to the accumulating effects of external circumstances. This design is important because it can help clarify the relative importance of person factors and situational factors even without direct measures of either.

Although the studies reviewed used above rely on very large, long-running panel studies that include nationally representative samples, it is also possible to use alternative methods for assessing stability of SWB measures. Anusic and Schimmack (2016) meta-analytically combined results from many different studies that reported stability estimates across varying intervals to isolate stable and changing components from SWB measures. Importantly, they were able to expand their analyses beyond life satisfaction to focus on both cognitive and affective components of SWB. Their meta-analytic results showed results that were quite similar to those from the panel studies, with reliabilities ranging from .58 for affect to .67 for life satisfaction. Furthermore, they found that approximately half of the reliable variance was due to stable factors and half due to changing factors. Results were somewhat similar for affect and life satisfaction, though the contribution of the stable component was slightly lower for affect than satisfaction. Importantly, Anusic and Schimmack were also able to compare the results for SWB measures to those from personality traits, and they found that the stable component accounted for a much larger percentage of variance in personality traits than for SWB measures (also see Fujita & Diener, 2005). For instance, the stable component accounted for about 40-50% of the variance in well-being measures, compared to about 80% of the personality measures. Thus, by decomposing stability coefficients in this way, it is possible to provide a very nuanced understanding of the stability of well-being measures; and these analyses strongly suggest that SWB measures are quite different from personality traits in terms of the levels of stability they exhibit.

The results reported above relied primarily on global assessments of well-being to derive estimates of stability. As noted previously, however, there are different ways to assess the various components of well-being, including the use of more *experiential* measures that track SWB over time. Because of the increased burden on respondents, experiential measures have been used much less frequently in large-scale studies that track representative samples over long periods of time, and thus, there is not as much information available about the long-term stability of such measures. One might expect stability to be weaker, as these experiential measures track immediate reactions to ongoing experiences, typically over at most a few days.

Recently, some studies have begun to test the stability experiential measures, including some large-scale panel studies. This provides important initial information about the longer-term stability of such measures. For instance, Baird, Le, and Lucas (2006) examined the six-month test-retest reliability of multiple measures of SWB, including life satisfaction and both global and experience-sampling-based measures of positive and negative affect. They found quite high stability (r s around .75) for all the measures they assessed. However, this study focused entirely on student samples. Krueger and Schkade (2008) examined the two-month test-retest stability of a day-reconstruction-based measure and found a correlation of .64, which was comparable to that for a life satisfaction measure assessed twice over the same period of time.

More recently, Hudson, Lucas, and Donnellan (2016) used day-reconstruction-method data from the German Socio-Economic Panel study over a three-year period. Even though the day reconstruction method used in this study sampled just a single day at each wave, one-year latent stability coefficients ranged from

.30 for negative affect to .47 for positive affect; and two-year stabilities were approximately the same size. These stabilities were lower than the stability of a single-item life satisfaction measures, which ranged from .50 to .59 in this sample (because just a single-item was used, these could not be adjusted for measurement error; thus comparisons between the measures must take this difference into account). Together with the results from Anusic and Schimmack (2016), this suggests that both experiential and global measures of affect exhibit moderate stability over time, and that this stability tends to be somewhat weaker than that for global life satisfaction measures.

The results reviewed above suggest that there is some degree of stability in SWB measures, regardless of which component is assessed and which type of measure is used. At the same time, long-term studies and meta-analytic evidence suggests that stabilities decline with increasing intervals, eventually leveling out to asymptote at long-term stability coefficients around .25 to .30, or .40 to .50 after correcting for measurement error. Together, this suggests that some truly stable personality factors contribute to well-being judgments, but that real change, including change that could potentially be linked to external circumstances, does occur. However, an important piece of evidence in early arguments for the role of personality as a determinant of SWB was the fact that well-being scores remained stable in spite of changing life circumstances (Brickman & Campbell, 1971; Costa et al., 1987). Thus, to fully address questions about the relative role of personality and external circumstances, it is necessary to review studies that explicitly focus on change that occurs following the experience of changing life circumstances.

Early evidence was interpreted as support for the idea that life circumstances simply do not matter. Most famously, Brickman, Coates, and Janoff-Bulman (1978) examined the SWB of a small group of patients with spinal cord injuries, a group of matched controls, and a group of lottery winners. Although the authors' conclusion was simply that scores of the patients with spinal cord injuries were not as low as one might expect (rather than that there were no differences at all), this study has had a strong impact on perceptions of people's ability to adapt. As Lucas (2007b) noted, the differences between groups was, in fact, quite large, and the extent of adaptation that occurred has been overstated. More recent studies that rely on large samples of participants with similar spinal cord injuries consistently show that the differences between these participants and those without such injuries are medium to large in size.

Simple cross-sectional studies like this are difficult to interpret. Better evidence for the impact of changes in life circumstances comes from studies that follow individuals before and after such changes occur. Of course, such studies are hard to conduct, as it is difficult to predict when rare events like the onset of a disability will occur. However, researchers have again relied on large-scale panel studies that follow large samples of participants for many years to examine these questions. With large enough samples and a long enough period of time, some small percentage of participants will experience an event. As long as SWB has been tracked throughout the study, pre-event levels can be estimated and compared to post-event levels to examine the effects of the changing circumstances.

Many studies have now been conducted that use this approach (see Lucas, 2007a, for a review). These studies show that changing life circumstances can have lasting effects on SWB, but the extent to which lasting changes occur depend on the specific event in question. For example, Lucas, Clark, Georgellis, and Diener (2003) found evidence that people quickly adapt to marriage (though see Anusic, Yap, & Lucas, 2014a, 2014b for complications regarding the interpretation of these effects), but that widows seem to be affected by the loss of their spouse for much longer. Similarly, Lucas, Clark, Georgellis, and Diener (2004) found evidence that life satisfaction permanently changes after a bout of unemployment, and Lucas (2007b) found evidence for large and permanent effects of the onset of disability on life satisfaction, especially for more severe conditions. Taken together, this evidence from longitudinal studies provides relatively clear support for the idea that life circumstances do matter for SWB and that personality is not the sole determinant of long-term individual differences (see Luhmann, Hofmann, Eid, & Lucas, 2012, for a meta-analytic review).

In summary, there is now considerable empirical evidence about the stability of subjective well-being measures over time. These studies reveal that in the short term, all components and measures of well-being are reasonably stable. As the test-retest interval increases, stability declines. Eventually, however, stability coefficients asymptote, and it appears that approximately one-third to one-half of the reliable variance (or one-quarter to one-third of the total variance) in these measures is truly stable trait variance that does not change even over very long periods of time. There is some indication that stability is slightly higher for life satisfaction than affect, but this may be due to differences in the measures (Anusic & Schimmack, 2016). Most studies that examine stability rely on self-report measures, which means that stability estimates may be inflated by stability in method factors such as response styles; thus future research should take a multimethod approach. Finally, studies that directly assess whether subjective well-being changes following major changes in life circumstances shows that such changes can and do occur, even though some amount of adaptation happens. Again, however, these studies of life events typically focus on life satisfaction as an

outcome, and there are fewer studies looking at the effects of life events on experienced affect.

The Heritability of SWB

The research reviewed above focused on the stability of SWB over time. One reason that this research has been used to support the idea that personality matters is that personality itself is thought to be stable, which leads to the idea that evidence for stability in SWB is evidence that personality matters. Of course, it is possible that situations and life circumstances are also quite stable over time, which would provide an alternative explanation for any stability in SWB that is observed. In addition, research that directly assesses the impact of stable situations on SWB is limited in its ability to clarify these issues because it is difficult to consider and assess all aspects of the situation and environment that may matter. Thus, researchers have turned to other designs to help clarify whether stability in well-being that is examined is truly due to the influence of internal factors versus stability in external, environmental features. One powerful set of techniques for answering these questions comes from behavioral genetic studies (also see Røysamb, this volume).

Although behavioral genetic studies represent a broad set of research designs, here I focus on evidence from the most common of these: the twin study and its variants (see Røysamb, Nes, & Vitterso, 2014, for a detailed review of these issues as they apply to research on SWB). Twin research takes advantage of the fact that identical twins have identical DNA, whereas fraternal twins share on average 50% of their genes. Thus, it is possible to estimate the influence of genes on SWB (or other observable characteristics) by comparing the similarity of identical twins to the similarity of fraternal twins. A simple estimate of heritability can be derived multiplying the difference between the identical twin correlation and the fraternal twin correlation by two.

Some of the earliest studies that examined the associations among twins found heritabilities close to .50 (Tellegen et al., 1988). However, the specific measures that were included were actually measures of stable personality traits, even though the traits that were examined had an affective focus. Since these initial studies were conducted, many additional studies have been reported, and these studies also find moderate heritabilities, even for traditional measures of subjective well-being such as the Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) or single-item measures of life satisfaction. For instance, Stubbe, Posthuma, Boomsma, and De Geus (2005) examined the broad heritability of life satisfaction in a sample of over 5,000 participants from the Netherlands Twin Registry, and they found a heritability estimate of .38. Bartels and Boomsma (2009) found heritabilities between .40 and .50 for different measures related to SWB, including a measure of life satisfaction. Indeed, enough studies have been conducted that Bartels (2015) was able to conduct a meta-analysis of heritability estimates for well-being measures, resulting in an average effect of .38 for general well-being and .32 for life satisfaction measures.

Studies focused on the heritability of SWB can be controversial because there is a tendency to interpret these studies as providing direct evidence about the extent to which SWB can change. Specifically, it is sometimes assumed that if something is highly heritable, then that means that change is not possible, or even that early interventions are doomed to failure. This mistaken assumption can even occasionally be reinforced by behavioral genetic researchers, such as when Lykken and Tellegen (1996) suggested that "It may be that trying to be happier is as futile as trying to be taller and therefore is counterproductive" based on their analysis of a longitudinal twin study. As Røysamb et al. (2014) point out, there are no clear and direct implications for the potential for change from heritability estimates on their own. Heritability estimates reflect a sample-based estimate of the variance that can be accounted for by genes, and this estimate can vary across populations. They note that in modern industrialized nations, the heritability of height is above 80%; but in the past, it presumably was much lower. This is because the environmental factors that may have caused appreciable variation in height in the past are now much more consistent, at least among individuals living in industrial nations. As a particularly salient example of this, Cheung et al. (2017) showed that overall levels of life satisfaction have declined by more than two standard deviations in Syria as the nation has descended into civil war; the severe environmental conditions clearly impacted global well-being despite the influence of any personality characteristics. These results show that caution is needed when drawing conclusions about the implications of high heritabilities for SWB. Røysamb et al. walk through a number of important caveats about the interpretation of heritability studies of SWB.

Ultimately, behavioral genetic studies of SWB are useful because they begin to constrain the possible explanations for individual differences in SWB that are observed. If meta-analytic estimates suggest that approximately one-third of the variance in life satisfaction is heritable (Bartels, 2015), then it will be necessary to develop theories that incorporate mechanisms that can account for such effects. The consistent result emerging from decades of behavioral genetic studies with many thousands of twins is that SWB is

moderately heritable, suggesting that some inborn features of people's personality have an influence on the stable levels of SWB that they experience. It is up to future investigations to clarify exactly how these processes work and how these inborn tendencies are translated into the individual differences in well-being that we observe.

Associations with Personality Traits

The most direct evidence for the importance of personality in SWB comes from studies that examine the association between specific personality factors and SWB. A quick review of the research that has been conducted on SWB shows that there is considerable empirical evidence for this idea. Even in one of the earliest reviews on the topic, Wilson (1967) stated that the happy person is best described as a "young, healthy, well-educated, well-paid, extroverted, optimistic, worry-free, religious, married person with high self-esteem, job morale, modest aspirations, of either sex and of a wide range of intelligence" (p 294). Although this description emphasizes what is known about demographic predictors of SWB, it is clear that personality factors like extraversion, optimism, high self-esteem, and even constructs related to goals and aspirations play a role. Since the time of Wilson's review, these early impressions have been confirmed with increasingly sophisticated research designs.

In one of the earliest systematic investigations of the links between personality and subjective well-being, Costa and McCrae (1980) specifically tested whether two personality traits---extraversion and neuroticism---were uniquely linked to specific SWB variables. Costa and McCrae argued that extraversion was associated with positive affect, neuroticism was related to negative affect, and together these dimensions formed the affective core of the broader SWB construct. Interestingly, the associations between personality traits and the affective dimensions were not especially strong, generally falling in the range of .20 to .30. However, this early study provided a precedent for later work on the topic. Subsequent studies focused on the structure of affect and the personality underpinnings of these dimensions often linked the independent traits of extraversion and neuroticism to separable positive and negative affect dimensions (e.g., Tellegen, 1985).

Perhaps because of the "disappointing" associations between SWB and objective life circumstances, along with the consistently larger correlations between SWB and personality traits; research on personality predictors of SWB flourished in the 1980s and 1990s (Diener & Lucas, 1999; Diener et al., 1999). Researchers examined the association of hundreds of trait/well-being combinations. For instance, DeNeve and Cooper (1998) conducted a meta-analysis of associations between various SWB components and 137 different personality traits. The traits that were most strongly associated with well-being were: "repressive-defensiveness, trust, emotional stability, locus of control-chance, desire for control, hardiness, positive affectivity, private collective self-esteem, and tension" (p. 197). DeNeve and Cooper also noted that well-being components of satisfaction, happiness, and positive affect were predicted equally well from personality traits, but that the association with negative affect tended to be weaker. Importantly, the overall estimates that they arrived at were relatively small, typically below .20.

The meta-analysis by DeNeve and Cooper (1998) illustrates a number of issues that must be taken into account when evaluating the associations between personality traits and SWB variables. First, the fact that they were able to include 137 different traits in their meta-analysis makes the entire endeavor somewhat overwhelming. Although 137 different measures can be identified, do these measures truly reflect 137 different constructs that need to be considered, each on its own? One goal of personality research over the past decades has been to reduce the number of constructs that are examined so that more parsimonious models can be developed (John, Naumann, & Soto, 2008). Indeed, of the traits that exhibited the strongest correlations in DeNeve and Cooper's meta-analysis, many are not widely studied.

Perhaps even more problematic is that by necessity, meta-analyses often aggregate across scales that have the same or similar names, but that reflect somewhat divergent content. For instance, Lucas and Fujita (2000) suggested that by aggregating across very different types of measures of extraversion, DeNeve and Cooper (1998) underestimated one association that, theoretically, should be quite strong: that between extraversion and the specific component of positive affect. Lucas and Fujita conducted a more targeted meta-analysis, which found much stronger associations between extraversion and positive affect, with an average correlation of .37. Furthermore, their analyses showed that the size of this correlation varied depending on which measures of extraversion and positive affect were used, supporting the idea that more targeted analyses provide important information about the nature of this effect.

In a related, but much larger investigation, Steel et al. (2008) updated the meta-analysis of DeNeve and Cooper (1998), focusing only on established measures of the Big Five personality traits and their associations with well-being components. Like Lucas and Fujita (2000), Steel et al. found much larger associations when these established measures were used. Importantly, their study showed that traits beyond

extraversion and neuroticism showed substantial associations with SWB. For instance, although in their analyses extraversion showed an average correlation of .44 with positive affect and neuroticism showed an average correlation of .54 with negative affect, even the traits of agreeableness and conscientiousness showed moderate correlations with some well-being components (with correlations in the range of .20 or .30). This meta-analysis confirmed that extraversion and neuroticism are especially important for SWB; but it also showed that additional traits may play a role and should not be ignored when considering the impact of personality on well-being.

Given these results, it is reasonable to ask what we should do about the rest of the 137 variables that DeNeve and Cooper (1998) examined. For instance, Wilson (1967) highlighted traits such as optimism and self-esteem as being particularly important for SWB, a finding that has been confirmed in subsequent systematic research (e.g., Lucas, Diener, & Suh, 1996). Furthermore, these traits have a long history of being studied independently from the Big Five (even if they are clearly related), and there are strong theoretical reasons to expect them to be linked with well-being, perhaps even having an effect beyond traits like extraversion and neuroticism. One recommendation for researchers interested in traits other than those in the Big Five is to (a) consider prior evidence like that included in DeNeve and Cooper's meta-analysis, (b) think carefully about the psychological mechanism that would link the trait to SWB, (c) include measures of extraversion and neuroticism in studies that examine the associations between the narrower trait and the well-being outcomes to ensure that there is incremental validity.² As the DeNeve and Cooper meta-analysis makes clear, there is a danger that personality researchers will continually be "reinventing the wheel" as they study related traits with different names as predictors of well-being outcomes. This is particularly important given that many "positive" characteristics tend to go together, just as many "negative" characteristics tend to correlate. Thus, it will be important to focus on personality-SWB relations that provide unique information about the role that personality plays in SWB.

The idea that good things tend to go together raises one additional issue that must be addressed when interpreting correlations between measures of personality traits and measures of SWB. That is, as typically assessed, these two types of measures share method variance, which may inflate correlations substantially. Remember, a critical part of the argument for the importance of personality traits as predictors of SWB is that the correlations between personality and well-being variables tend to exceed correlations between objective factors and SWB. However, if the former are inflated by shared method variance, then this comparison may not be fair.

For example, Lucas and Fujita (2000), in their meta-analysis, separately examined correlations between extraversion and positive affect that used the same method of assessment for both variables and those that used different methods of assessment. Not surprisingly, the correlation was significantly larger when the same method was used ($r = .37$) than when different methods were used ($r = .25$). Indeed, the correlation when different methods were used was only slightly larger than the correlation between SWB and income (Lucas & Schimmack, 2009), a correlation that has often been dismissed as being very small (Myers, 2000). Lucas and Fujita's meta-analysis confirmed that the association is not due *solely* to shared method variance, but it does highlight the role that shared method variance plays. Few systematic investigations of the role that shared method variance plays in other personality-SWB associations have been conducted, but it is highly likely that the effect is similar in these different domains. Thus, we encourage researchers to consider using alternative methods of assessment when examining the links between personality and well-being to separate the substantive associations from those due to shared method variance.

A final issue regarding the associations between personality traits and SWB concerns the extent to which specific personality traits (or even specific facets of personality traits; Sun, Kaufman, & Smillie, 2017) exhibit differential associations with different components and measures of SWB. The meta-analysis by Steel et al. (2008) showed that indeed, extraversion correlated most strongly with positive affect (compared to other components of SWB) and neuroticism correlated most strongly with negative affect. These results are consistent with the idea first raised by Costa and McCrae (1980) that extraversion and neuroticism affect global well-being through their unique associations with positive and negative affect, respectively. In support of this idea Schimmack, Oishi, Furr, and Funder (2004) showed that the facets of extraversion and neuroticism that were most closely linked to positive and negative affect accounted for most of the association between these traits and life satisfaction. This also suggests that future work examining the associations between traits beyond extraversion and neuroticism and well-being related outcomes such as life satisfaction can focus specifically on mechanisms that link these constructs independently from extraversion and neuroticism.

Some research has also begun to investigate the links between personality and alternative measures of well-being variables. For instance, Lucas and Fujita (2000) showed that self-reports of extraversion

predicted more experiential measures of well-being, such as daily reports of positive affect, somewhat less strongly than they predict global measures of well-being ($r = .28$ versus $r = .39$). Similarly, Lucas, Le, and Dyrenforth (2008) found larger correlations with extraversion for global reports of positive affect ($r = .53$) than for aggregated daily or experience-sampling-based reports ($r_s = .39$ and $.31$, respectively). More recently, Anusic et al. (2017) compared self and informant reports of personality to global and experiential (day reconstruction method) measures of subjective well-being. Across two student samples, global measures of affect were at least as strongly, if not more strongly correlated with both self and informant-rated personality than the day-reconstruction-based measures. This result was replicated in a community sample by Hudson et al. (2016). These results indicate that experiential measures based on experience sampling or the day reconstruction method tend to correlate somewhat less strongly with personality measures than do traditional measures of affect.

Overall, this review confirms the importance of personality traits as correlates of various components of SWB, while also pointing to some substantial caveats. First, meta-analytic summaries show that personality traits do show some of the strongest associations with SWB, with the associations between extraversion and positive affect and between neuroticism and negative affect being particularly strong. A close look at the literature, however, suggests that these associations are inflated somewhat by shared method variance, meaning that the associations between personality and well-being outcomes are not as much larger than correlations between SWB and external circumstances as it might first appear. The meta-analytic evidence is rich enough to show that the associations themselves do not result entirely from method variance, but future research should take concerns about method variance more seriously when examining these effects. The research also shows that correlations do vary across different components and measures of well-being, with somewhat weaker associations for experiential measures like the day reconstruction method or experience sampling method, as compared to global reports of affect. Future research can help clarify whether these discrepancies are due to differences in the underlying processes or to psychometric differences across measures.

Why Does Personality Matter?

The literature reviewed above provide clear evidence that the stable individual differences that personality psychologists typically study are related to the SWB that people report. SWB scores are somewhat stable over time, even in the face of changing life circumstances; this stability appears to be due, at least in part, to in born genetic factors; and there are robust and moderately strong associations between specific personality traits and SWB measures. Thus, an important question concerns the mechanisms that may underlie these associations. Once the empirical links are established, research can proceed to explain why these effects exist.

In terms of general mechanisms, many different approaches have been considered. For instance, one class of mechanisms suggest that the behaviors that result from stable individual differences in personality traits can directly or indirectly lead to well-being related outcomes. Decades of research has now shown that personality can predict consequential outcomes, often with effect sizes that are larger than other widely studied predictors such as intelligence or socioeconomic status (Ozer & Benet-Martinez, 2006; B. Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). It is possible that the associations between personality and well-being-related outcomes flow through the different behaviors that individuals with different personalities exhibit or different environments that they choose.

Alternatively, a different class of explanations focuses on the way that people perceive the world around them. The fact that different people respond differently to the same external circumstances suggest that there may be fundamental differences in outlook and perception that contribute to individual differences in well-being. For example, early work by Rusting (1998) focused on basic cognitive processes that may differ across individuals and that could promote greater or lesser well-being. Some people may attend more to positive things in their environment, whereas other people's attention may be naturally drawn to threats in the environment. Some people may find it easier to remember positive life events, whereas for others, negative experiences may more easily come to mind. Even the interpretation of the same event may differ across individuals; Diener, Lucas, Oishi, and Suh (2002) suggested that there are stable individual differences in whether people use information about who is better or worse than they are when evaluating their standing on a domain. These fundamental, low-level processes could add up to stable individual differences in the well-being that people experience and report (see Robinson & Compton, 2008, for a review).

Currently, there is no single, comprehensive model that clarifies how either a specific personality trait or a set of individual differences affect SWB outcomes. However, there are good examples of what such a theory would look like. Therefore, in the next section, I focus on one example where considerable

theoretical and empirical work has been done to investigate a specific personality/SWB association: The link between extraversion and positive affect.

An Example: Extraversion and Positive Affect

As noted above, even in the earliest reviews, the importance of extraversion for SWB was emphasized (e.g., Wilson, 1967). Costa and McCrae (1980) suggested that extraversion directly influenced one of two major affective dimensions (positive affect), and these affective dimensions formed the core individual differences underlying reports of SWB. Later factor analytic work confirmed and clarified the links between extraversion and an activated form of positive affect (Depue & Collins, 1999; Lucas, Diener, Grob, Suh, & Shao, 2000; Tellegen, 1985; Watson & Clark, 1997).

Attempts to clarify the mechanisms underlying these effects have proceeded in a number of different directions. For instance, McCrae and Costa (1991) posited two broad classes of explanations that could be considered: an *instrumental* explanation, which focuses on well-being as an indirect outcome of the behaviors that extraverts tend to do; and a *temperament* model, which focuses on the direct links between underlying physiological systems and the affective experiences that people have.

In regard to the former class of explanations, many researchers have looked closely at what extraverts do differently than introverts that might explain why they are happier. For instance, Diener, Larsen, and Emmons (1984), Emmons, Diener, and Larsen (1986), and Pavot, Diener, and Fujita (1990) used daily diary and experience sampling studies to assess whether extraverts participated in social activity more than introverts or enjoyed that experience more, as a way of explaining extraverts' greater positive affect. Later, a number of researchers followed up on this work with larger samples and more sophisticated sampling designs (Lucas et al., 2008; Oerlemans & Bakker, 2014; Srivastava, Angelo, & Vallereux, 2008). These studies consistently showed that extraverts do participate in greater amounts of social activity and that social activity is associated with higher levels of positive affect, but that these differential experiences cannot fully account for extraverts' greater positive affect. A related line of research focuses on experimental evidence linking extraverted behaviors with experiences of positive affect. Specifically, Fleeson and his colleagues have shown that asking people to act in an extraverted manner increases levels of experienced positive affect (Fleeson, Malanos, & Achille, 2002).

Other researchers have more directly examined the temperament-based explanations. Many of these investigations are at least loosely based on a model of personality developed by Gray (Gray, 1970, 1991; Gray & McNaughton, 2000), in which different physiological systems regulate responses to rewarding or punishing stimuli in the environment. For instance, one possible mechanism underlying extraversion is an underlying sensitivity to reward, such that extraverts have stronger responsiveness to reward, which could manifest in the form of increased wanting for potential rewards or increase liking of achieved rewards (see Smillie, 2013, for a recent review). Some have posited that the precise system that underlies these effects relates to individual differences in dopamine function (Depue & Collins, 1999), though evidence for specific hypotheses related to this possibility is mixed (Wacker & Smillie, 2015).

A variety of specific research questions follow from the idea that extraverts may be more sensitive to rewards than introverts and that this difference is responsible for their greater happiness. For instance, early studies suggested that extraverts, when exposed to positive emotional stimuli (e.g., a positive mood induction procedure in the lab), would respond more positively than introverts (Larsen & Ketelaar, 1991). However, this initial effect frequently failed to emerge in laboratory studies (Lucas & Baird, 2004), and more naturalistic studies rarely found support for the idea that extraverts respond more positively to positive experiences or events (Anusic et al., 2014a; Lucas et al., 2008; Yap, Anusic, & Lucas, 2012). More recently, however, Smillie and colleagues found support for a possible resolution to the contradictory evidence, showing that extraverts appear to respond more strongly to *appetitive* stimuli, rather than simply *pleasant* stimuli. This distinction fits with the underlying reward sensitivity and may explain inconsistencies in past research.

Together, the studies from this large literature provide ample avenues for future research on the association between extraversion and positive affect. To be sure, existing studies do not yet provide a complete answer about why these constructs are related. However, the various approaches that have focused on behaviors, cognitive factors, emotional reactions, etc., provide a clear model for how research on personality and well-being variables can proceed. These studies posit various mechanisms by which one can get from relatively basic, low-level mechanisms that can be tested in the lab or in more naturalistic studies. It is likely that research on extraversion and positive affect will provide useful information not just for understanding this pair of constructs, but for researchers who are beginning to think about mechanisms that may link other trait/well-being associations.

Summary

Research on the links between personality and SWB is important partly because the strong associations have been so surprising to lay people and scientists alike, partly because of the amount and breadth of evidence that has accumulated for the robustness of these effects across different constructs and methods of assessment, and partly because of the rich theories that have emerged to explain the correlational findings that alerted early well-being researchers to the stable individual differences in well-being that exist. Incredible progress has been made on all of these questions, so much so that perhaps more than any area in psychology, researchers are able not only to specify that some degree of stability or heritability exists, or that some personality traits predict well-being variables, but also to make relatively precise point predictions about the size of these effects. Thus, research on personality and well-being can serve as a model for how research on the factors underlying well-being can proceed.

That being said, there is still considerable work to be done. This area of research, like many areas within SWB more broadly, suffers from an over-reliance on self-report methods. This makes comparisons between various predictors of SWB somewhat difficult to make, as personality predictors often share method variance. Future work that relies on multiple methods of assessment, both of the personality predictors and the well-being outcomes, will help further clarify these associations. And, as with most areas of well-being research, greater emphasis on the processes that underlie these associations will advance not only theories of SWB, but basic theories of personality themselves.

Footnotes

¹It is also important to note here that random measurement counts as a *state-like* influence that leads to instability from one occasion to the next.

²It is also important to use techniques for testing incremental validity that provide a conservative test of the importance of the new construct; see Westfall and Yarkoni (2016) for a discussion.

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