

# Does Happiness Change? Evidence from Longitudinal Studies

Stevie C. Y. Yap, Ivana Anusic, and Richard E. Lucas

*Michigan State University, East Lansing, MI, USA*

Subjective well-being (SWB) reflects a person's subjective evaluation of the quality of his or her life as a whole. This construct is typically measured using global questions that ask respondents how they feel in general, or through intensive assessments of how a person feels on a moment-to-moment basis. SWB is important partly because laypeople value it; in general, people prefer to be happy with their lives rather than unhappy. In addition, an increasing amount of research suggests that SWB is actually good for people. It can lead to additional positive outcomes in people's lives such as better health or increased productivity (Lyubomirsky, King, & Diener, 2005).

If SWB is something that people value, either for intrinsic reasons or as a means to obtain other outcomes, then an important goal for research is to understand how SWB can be improved. The applied value of well-being research would be dramatically reduced if there was ultimately nothing that could be done to improve it. In addition, some have suggested that it might be useful to track well-being for policy purposes (Diener, Lucas, Schimmack, & Helliwell, 2009), but such programs would provide little value if well-being was unaffected by policies or features of daily life that these policies directly affect. Therefore, one of the most fundamental questions that well-being researchers must tackle is whether SWB can change.

Historically, there has been some amount of skepticism regarding the possibility of change in SWB. This skepticism was due, in part, to early research that emphasized the relatively strong role that personality traits played as predictors of subjective well-being, at least in comparison to the role that situational and environmental factors played (Diener & Lucas, 1999).

For instance, early work often compared the size of demographic predictors such as age, gender, income, and education to personality predictors such as extraversion and neuroticism. Typically, this research found that demographic predictors and factors other than personality traits were only weakly correlated with SWB (Diener, Suh, Lucas, & Smith, 1999), whereas the associations with personality were much stronger (Steel, Schmidt, & Shultz, 2008). Similarly, robust and widely replicated research from behavioral geneticists showed that heritabilities for well-being variables tend to be moderate in size, whereas the effects of shared environments tend to be small or nonexistent (e.g., Tellegen et al., 1988). These results seemed to confirm the idea that personality, but not environments, mattered for well-being.

In addition to this indirect evidence regarding the possibility for change, a number of studies appeared to show strong stability of well-being measures over time or—even more dramatically—an apparent imperviousness to change in spite of the most extreme events imaginable. Most famously, Brickman, Coates, and Janoff-Bulman (1978) suggested that neither winning the lottery nor suffering a severe spinal-cord injury will lead to lasting changes in happiness. As a result of this evidence, researchers posited that numerous factors worked to prevent lasting changes in subjective well-being (Diener, Lucas, & Scollon, 2009). For instance, the emotional reactions to the world that might form a basis of subjective well-being judgments might be strongly and directly influenced by stable personality traits so that our perception of the world around us may be more important in driving well-being than the actual events that happen. Alternatively, Headey and Wearing (1991) suggested that personality characteristics influence the events that happen to us, and in general, these processes serve to maintain an equilibrium in well-being (even if the traits themselves do not directly cause the emotional reactions).

Still another possibility was that the weak effects of situational factors result not from an overwhelming influence of personality traits but from adaptation processes that are actually functional (Frederick & Loewenstein, 1999). There are numerous reasons to expect that it might be advantageous to attend to change in one's environment rather than characteristics that remain stable. Therefore, evolution may prepare organisms to adapt to constant stimuli both in terms of their physical reactions (in the case of temperature, smells, visual stimuli in the environment, or brightness of light) and in their emotional reactions. If so, then *adaptation* (in the sense of getting used to constant stimuli) might be *adaptive* (in the sense of helping the organism that has this capability). So not only did the evidence appear to support the idea that life circumstances played a small role in subjective well-being, but there were (and still are) compelling theoretical reasons to expect such effects.

Yet despite this skepticism, there are reasons to remain hopeful about the possibility of change in well-being. Many of the chapters in this book discuss

specific theoretical reasons that change might be attainable or specific routes to change. Our chapter addresses a more basic question of whether the evidence from longitudinal studies suggests that change does, in fact, occur. Specifically, we review recent longitudinal findings on the rank-order stability of well-being, along with studies that examine mean-level change following major life events. These studies, which improve on those mentioned previously in many ways, show that considerable change does occur, which provides initial evidence that interventions to improve well-being may be possible.

## UNDERSTANDING CHANGE THROUGH STABILITY COEFFICIENTS

A common approach to studying whether life satisfaction can change is to study stability of individual differences in life satisfaction. This approach can inform us about the extent to which rank-ordering between individuals is preserved over time. For example, if Samantha was happier than Jonathan when they were kids, will she still be happier in adulthood? Traditionally, questions such as this one are studied by examining test–retest correlations of life satisfaction over time. Higher retest correlations would indicate that rank-order was preserved to a greater degree than lower correlations. In turn, these high retest correlations would suggest that happiness does not change much, at least over the time period being studied.

Early studies on stability of individual differences in life satisfaction were almost exclusively based on two-wave designs. Moreover, they generally examined correlations over relatively short retest intervals—weeks, months, at best up to a few years (e.g., Pavot & Diener, 1993). Information from these studies can tell us about the extent to which individual differences are preserved over such time periods. However, they do not allow for broad conclusions about stability over time because two-wave retest correlations obscure influences of different factors on life satisfaction, some of which lead to stability and some of which lead to change (Conley, 1984; Fraley & Roberts, 2005). This leads to difficulties in interpreting two-wave retest correlations in the context of stability.

For example, what does a 1-month retest correlation of .7 tell us about stability of life satisfaction? Can we say that life satisfaction has changed, or should we say that life satisfaction is stable? We would likely make different conclusions if the 10-year retest correlation was also .7 than if this 10-year stability coefficient was .1. In the former case, we may conclude that although life satisfaction may not be perfectly stable in the short term, individual differences are quite well preserved over very long time periods. In the latter case, we might conclude that there is much change in life satisfaction because it is difficult to predict rank-ordering over longer periods of time from people's initial standing.

The problems involved in this example are not just due to the short time frame of the 1-month retest correlation. They are also due to the limitations of two-wave designs. For instance, even if we found that the 1-year stability of life satisfaction was .7, it is impossible to predict from this value whether the 5-year stability will be equally high or whether it will be zero. As we discuss in more detail later, some underlying models—such as a purely autoregressive model—would mean that a 1-year stability of .70 would translate into a 5-year stability of just .17 (the formula to get this value involves taking the stability for one interval—a year in this case—to the power of the number of intervals:  $.7^5 = .17$ ). Other, equally plausible models, however, might suggest that the .70 stability over a 1-year interval would be maintained even over periods that are many years longer. In short, it is simply not possible to distinguish between short-term change and long-term stability from a two-wave retest correlation.

## ALTERNATIVES TO TWO-WAVE DESIGNS

Although it is difficult to draw conclusions about stability from any single retest correlation, a pattern of retest correlations obtained over different retest intervals provides more information about the extent of stability and change over time as well as different processes that may influence life satisfaction over time (Conley, 1984; Fraley & Roberts, 2005). In general, correlations are highest over shortest retest intervals, lower over longer retest intervals, but asymptotic at a value higher than zero. This pattern is seen across different psychological constructs (e.g., intelligence, personality) and suggests multiple influences on constructs over time. For example, Fraley and Roberts (2005) suggested that influences of developmental constants (e.g., genotype) are reflected in the asymptote because they lead to stability over time. In contrast, they suggested the cumulative effects of occasion-specific influences were responsible for the decay of retest correlations over time and that person-environment interactions resulted in increasing stability over the life span. To understand whether happiness can change, we need to understand the extent to which these stable and changing influences affect life satisfaction.

With multiwave longitudinal designs, it is possible to use trait-state analytic models that can separate influences of more stable factors from less stable factors (Cole, Martin, & Steiger, 2005; Eid & Diener, 2004; Kenny & Zautra, 1995, 2001; Steyer, Schmitt, & Eid, 1999). Although these models vary in details, they generally assume three types of influences on a construct. First, there are stable influences that do not change even over very long periods of time, such as developmental constants suggested by Fraley and Roberts (2005). These may include biological factors such as one's genetic make-up, but also reflect very stable features of the environment or the effects of early environment that have had a

lasting impact. Because these types of factors do not change over time, they allow us to perfectly predict a person's future standing on a construct. Stable influences are the reason that retest correlations do not reach zero even at very long retest intervals.

On the other end of the trait-state continuum, there are influences that produce changes even over very short time periods. These may reflect influences of random measurement error, transient influences that may not be related to the construct at hand (e.g., effect of mood on judgments of overall life satisfaction), or relevant influences whose effect is limited to the length of the retest interval. Because these factors differ from one measurement occasion to another, they make it impossible to predict future life satisfaction from today's life satisfaction.

In between these two extremes, there are factors that produce longer-lasting changes in rank-ordering. They include random events that affect life satisfaction and whose influences gradually accumulate over time, as well as person-environment interactions that lead to steadily diverging life satisfaction trajectories as people select environments that continually make them more (or less) happy. Because of the cumulative effect of these influences, they make it more difficult to predict future life satisfaction over longer time intervals than over shorter time intervals. Isolating these different influences on life satisfaction over time can tell us more about causes of stability and change than two-wave retest correlations.

Although state-trait models can provide valuable information about stability and change over time, their use in research has been somewhat limited. One difficulty in applying these models is that they require longitudinal studies with at least four but preferably many more testing occasions (Cole et al., 2005; although simpler models that allow for the separation of some components can be tested with just three waves; see Anusic, Lucas, & Donnellan, 2012). Moreover, for one to be able to identify all three sources of influence, these studies need to span long periods of time (i.e., many years). Fortunately, several large longitudinal studies exist that fit these criteria. These studies survey nationally representative samples of residents of Germany (German Socio-Economic Panel—GSOEP), Great Britain (British Household Panel Study—BHPS), Australia (Household, Income, and Labour Dynamics in Australia—HILDA), and Switzerland (Swiss Household Panel—SHP), and have been asking participants about their life satisfaction every year for many years (e.g., the German panel has been ongoing since 1984).

One particular trait-state model, Kenny and Zautra's (2001) Stable Trait Autoregressive Trait State (STARTS) model, has been used to study life satisfaction over time. The STARTS model partitions observed variance in a construct into three components. The stable trait (ST) variance reflects stable influences. The autoregressive trait (ART) variance reflects influences that produce slow changes over time (e.g., life events, person-environment

interactions). The state (S) variance reflects occasion-specific influences that produce changes even over short periods of time (e.g., measurement error, transient influences). Multivariate versions of this model can isolate separate state variance into measurement error and true, occasion-specific variance (Lucas & Donnellan, 2012).

Lucas and Donnellan (2007) used the STARTS model to study life satisfaction over time in the GSOEP and the BHPS. In this study, 8,632 German participants provided 21 waves of life satisfaction data, and 9,437 British participants provided 8 waves of data. The authors found that stable influences (ST) accounted for 34% and 38% of observed variance in life satisfaction in the GSOEP and the BHPS, respectively. Slowly changing influences (ART) accounted for 34% of observed variance in the German sample and 29% of variance in the British sample. In both samples, 33% of variance was occasion-specific (i.e., due to state factors).

These results were replicated in another study in which the authors used more waves and larger samples from the GSOEP and the BHPS (Lucas & Donnellan, 2012). In addition, the authors fit the STARTS model to data obtained from the HILDA and the SHP. The results were similar to those obtained from other samples: stable trait accounted for 31% and 26% of observed variance in the HILDA and the SHP, respectively; autoregressive trait comprised 32% and 36% of variance in the two datasets; whereas 37% and 38% of variance was due to occasion-specific factors. Thus, there is substantial agreement across large datasets from four countries that about a third of variance in life satisfaction is stable even over very long time periods, another third changes slowly over time, and the remaining third is occasion-specific.

Separating different influences on life satisfaction can allow researchers to investigate further processes that underlie these influences. For example, Lucas and Donnellan (2007) found that the proportion of life satisfaction variance that is accounted for by the stable trait was incrementally higher for older age groups than young adults. A possible reason for this finding is that people's life circumstances become increasingly stable over time, leading to increasing stability in life satisfaction. Luhmann, Schimmack, and Eid (2011) applied the STARTS model to life satisfaction and income and found that most of the association between the two variables occurred at the trait level. This finding suggests that same processes may lead to stability in life satisfaction and income. In a longitudinal study of spouses, Schimmack and Lucas (2010) found that similar factors lead to stability and slow changes in life satisfaction in spouses, but that occasion-specific factors likely differ. Researchers have also used the STARTS model to further examine sources of occasion-specific influences. For example, Lucas and Donnellan (2012) found that on average 26% of the occasion-specific variance in life satisfaction was shared with satisfaction with specific life domains (e.g., health, housing), whereas the remaining 74% was likely due to other, less reliable influences.

Complex models like the STARTS are challenging to estimate and thus are not always ideal. However, the logic behind these models can be used even when the models themselves are not tested specifically. Researchers have also used other approaches to study life satisfaction over long periods of time, and these studies generally reach similar conclusions to those that use more complex models (although they have less quantitative precision). For example, to study whether there was a set point of life satisfaction, Fujita and Diener (2005) used the GSOEP to compare average life satisfaction in the first 5 years of study with the 5-year average 12 years later (also see Headey, Muffels, & Wagner, 2010). They found that baselines of almost a quarter of the participants changed significantly over this time period. They also found that it was the least satisfied people who were more likely to change in the future.

In sum, empirical evidence suggests that there are processes that lead to both stability and change in well-being. About a third of observed variance in life satisfaction is influenced by factors that promote stability, and another third is influenced by factors that lead to slow changes over time. The remaining variance is specific to the year of measurement and includes measurement error. Separating these influences is the key to understanding processes that promote stability and change over time. Longitudinal studies using newer modeling techniques are useful for accomplishing this goal.

## LINKING CHANGE TO THE EXPERIENCE OF LIFE EVENTS

The research described in the preceding section is important for the question of whether happiness can change because it describes, on average, how stable happiness measures are. When we look at rank-order stability, it is possible to determine whether, in a typical population, those people who are happy at one point in time are still happier than others many years later. If stability is low, then this provides evidence that happiness can and does change, even if the studies themselves do not provide evidence about what is causing that change. On the other hand, if stability is extremely high, then it suggests that the broad range of events that tend to happen to people over time do not lead to major changes in the rank-order of happiness in a population. Thus, research that examines rank-order stability provides important information that can be used to guide subsequent theories about how much change we should expect to find and what sorts of factors should promote that change. Notably, the research described previously suggests that long-term stability coefficients bottom out at around .25 to .30, which means that over long periods of time, considerable change in well-being measures does occur.

Unfortunately, studies that focus solely on test–retest correlations do very little to provide evidence about the factors that actually do lead to change. Thus, researchers have turned to alternative methods to determine

whether happiness changes over time. One of the most encouraging of these methods involves studies that use long-term panel data not only to examine stability coefficients, but also to determine whether there are lasting changes in subjective well-being following specific major life events. The degree to which one's SWB is affected by the experience of major life events, such as getting married, having children, and experiencing the death of close others, is an important concern for many people. Major events are central to many people's lives, and lay theories suggest that many major life events should have a large impact on one's SWB. People work hard to achieve some events (such as marriage) and exert large amounts of effort to avoid others at all costs (e.g., unemployment).

Much empirical research has been devoted to identifying the factors that predict individuals' levels of SWB, and a substantial portion of this body of research evaluates the link between the experience of major life events and changes in SWB. As discussed previously, much of the early research exploring these questions suggested that there are relatively small associations between objective life circumstances and SWB. Indeed, early research indicated that this is true of many major life events as well. Adaptation studies that examined the SWB of individuals who experienced some important life event compared to control groups who did not experience an event often found little or no differences in SWB among groups. For instance, as noted earlier, [Brickman et al. \(1978\)](#) compared among individuals with spinal cord injuries, lottery winners, and a control group who did not experience these events. The results of this study suggested that levels of SWB in lottery winners were not significantly different from controls, and that people with spinal cord injuries were, in the authors' words, not as unhappy as one would expect. Brickman et al. concluded that their study showed compelling evidence that individuals largely adapt to major life events, and even extreme events such as sustaining spinal cord injury and winning the lottery do not appear to impact individuals' SWB.<sup>1</sup>

Although at first glance the early research in this literature offers impressive evidence that individuals inevitably adapt to major life events and changes in life circumstances, it is important to note that this research was also limited in a several important ways. First, many of these findings have relied on studies using cross-sectional designs, which are known to have serious limitations. For instance, cross-sectional studies cannot rule out the possibility that any observed differences between individuals who

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1. It is important to note that many reviews incorrectly claim that [Brickman et al. \(1978\)](#) found no significant differences among the groups they examined. As [Lucas \(2007a\)](#) pointed out, those with spinal cord injuries were actually significantly lower in well-being, and the size of these differences were large. The original authors interpreted the size of the difference in raw scale units as being surprisingly small, and it is this subjective interpretation that has influenced subsequent interpretations of this study.

have experienced a particular life event and those who did not are due to pre-existing differences among the groups. It is possible, for instance, that individuals who are predisposed to experience certain events are also more likely to have higher or lower levels of SWB before the event even occurred, and any differences between groups may reflect these pre-existing differences (e.g., there are likely pre-existing differences between individuals who eventually marry and individuals who do not marry or get married later in life). Thus, using a cross-sectional design, one simply cannot disentangle differences due to the experience of a particular event from pre-existing differences among groups, and simply comparing SWB levels across groups without accounting for levels of SWB experienced prior to an event may over- or underestimate the effects of an event on SWB.

A second limitation of the research in this literature is that much of it relies on relatively small samples. There are practical reasons why this has been the case, as it is often difficult and time-consuming to recruit large numbers of individuals who have experienced a particular life event. This is particularly the case for research evaluating the effects of relatively rare life events such as major disability or financial windfall (e.g., [Brickman et al., 1978](#)). Reliance on small samples yields studies with low statistical power and may lead one to question the reproducibility of an individual study's findings or the generalizability of a given finding to a larger population.

This initial research literature was also limited in the way in which participants were recruited. Given the difficulty in recruiting participants who are likely to experience a particular life event, many studies actively sought out participants who had already experienced the life event of interest. Although explicitly recruiting participants because they experienced a particular life event was often necessary in order to acquire large enough samples for analyses, this method of participant recruitment also can be problematic because it makes the focus of the study known to participants and thus introduces the possibility that demand characteristics will affect study results. In this case, participants' ideas about the focus and aims of the study may affect how they respond to study measures. For instance, if an individual was aware that he was being recruited to participate in a study because he recently became unemployed, the participant's ideas about how unemployment ought to affect an individual's SWB may affect how he responds to questions about his well-being. Further, this person may be motivated to self-present as more adjusted than he really is.

The effects of demand characteristics were demonstrated in a study by [Smith, Schwarz, Roberts, and Ubel \(2006\)](#). This study showed that individuals suffering from Parkinson's disease reported lower SWB when they were told the focus of the study was Parkinson's disease compared to when individuals were told that the general population was the focus of the study. Knowing the focus of a study may introduce bias in an individual's

responses, and such biases may have colored participants' responses in much of the initial research in this area.

To address these limitations, recent work has begun to use more sophisticated designs to evaluate the association between major life events and SWB. For instance, recent research that has evaluated the association between various major life events and SWB has examined these questions using very large nationally representative panel studies. This line of research has several advantages over the initial research described previously, and although it is not without limitations of its own, it can provide more definitive evidence than most cross-sectional designs. The main advantages of these studies are that they employ long-term longitudinal designs and typically examine questions using relatively large numbers of people. For example, the GSOEP has been used in several recent studies that evaluated the effects of various life events on adjustment (e.g., Galatzer-Levy, Bonanno, & Mancini, 2010; Lucas, 2007b; Stutzer & Frey, 2004). This panel study includes a nationally representative sample of more than 40,000 individuals living in Germany who have been assessed at yearly intervals for decades (some since 1984). Because the panel studies used in this research typically follow large cohorts of people over many years, they have offered researchers an economical yet powerful way to evaluate the long-term impact of major life events on SWB. With such large initial sample sizes, researchers using these data have been able to identify relatively large samples of respondents who have experienced even rare life events and have been able to explore the impact of these events over long periods of time.

Another important advantage to using these panel data is that they are prospective and allow researchers to make within-person comparisons of pre-event and post-event levels of SWB over time. Prospective designs are advantageous because they virtually eliminate the possibility that effects of a life event on SWB are due to pre-existing differences among those who experience events and those who do not because the critical test of the effects of experiencing a life event involves comparing average levels of SWB before experiencing an event to average SWB in the years that follow an event within the same person. Of course, these designs are still correlational, so it is not possible to definitively prove the causal association between the event itself and the change that occurred (there could be third variables that caused both the event and the change), but such studies can test whether substantial changes do actually occur when events happen.

Finally, use of panel data to evaluate the association between life events and SWB also minimizes the potential for demand characteristics to bias study findings. As discussed earlier, these panel studies include nationally representative samples numbering in the tens of thousands. These individuals are not recruited for any particular reason or on the basis of any particular individual characteristic. Further, participants in these studies are also asked to respond to a wide range of questions on a variety of topics and

characteristics of one's life. Thus, it is unlikely that the variables selected to be included in any one study using these data would be particularly salient to an individual respondent, nor would respondents be influenced by the focus of a particular study incorporating their responses—because they are not recruited with this focus in mind. This is an important advantage because it minimizes the potential for demand characteristics, but in many cases allows researchers to evaluate large enough samples of individuals who experienced a particular life event for tests of how the experiences of these events are associated with SWB.

## RESULTS FROM RECENT LONGITUDINAL STUDIES

In contrast to the findings of the initial cross-sectional literature and the adaptation theories that grew from this body of research, longitudinal work that has evaluated the impact of major life events on SWB using panel data like those described earlier indicates that the experience of some major life events is associated with changes—and sometimes even large changes—in individuals' SWB. In some cases, these changes are also long lasting, and some life events affect individuals' SWB many years following an event. However, this research also indicates that the amount of change and the permanence of these changes do vary across event type. For example, studies that have used nationally representative samples of German and British households suggest that, following an initial reaction period, individuals adapt back to pre-event levels of SWB after marriage and childbirth relatively quickly (Clark, Diener, Georgellis, & Lucas, 2008; Dyrda & Lucas, 2013; Lucas, Clark, Georgellis, & Diener, 2003; Stutzer & Frey, 2006; see also Galatzer-Levy, Mazursky, Mancini, & Bonanno, 2011). However, there is also evidence that the death of one's spouse results in substantial declines in life satisfaction, followed by a gradual adaptation back to baseline levels that can take many years (Clark et al., 2008; Lucas et al., 2003; Specht, Egloff, & Schmukle, 2011). Indeed, other negative life events, such as unemployment, result in lasting declines in life satisfaction that persist even after finding new employment (Clark, 2006; Clark et al., 2008; Lucas, Clark, Georgellis, & Diener, 2004; Powdthavee, 2012). A study by Lucas (2005) that examined reaction and adaptation to divorce in the GSOEP also showed a similar pattern. This study found that the experience of divorce was associated with a decrease in life satisfaction in the time leading up to the year of divorce, and that although SWB began improving in the year of divorce, complete adaptation to premarriage baseline levels did not occur in the years that followed.

Although the advantages of these longitudinal studies make the findings of these studies quite compelling, it is important to note that there is variation in findings from study to study regarding how major life events affect SWB. This is the case even among studies using the same panel dataset to

evaluate the impact of the same life event. For instance, [Lucas \(2007b\)](#) used two nationally representative panel studies (the GSOEP and the BHPS) to demonstrate that lasting declines in life satisfaction result from the onset of long-term disability. However, subsequent studies using the same datasets by [Oswald and Powdthavee \(BHPS; 2008\)](#), [Powdthavee \(BHPS; 2009\)](#), and [Pagán-Rodríguez \(GSOEP; 2012\)](#) suggest that individuals' SWB does recover from the losses associated with the onset of disability. Similarly, [Lucas \(2005\)](#) found evidence for incomplete adaptation to divorce in the GSOEP, but subsequent analyses by [Clark et al. \(2008\)](#) in the same data show evidence of adaptation to divorce.

As [Oswald and Powdthavee \(2008\)](#) note, the exact reasons for these discrepancies in results are unclear, but given that these studies use the same initial data, it is clear that these discrepancies result from differences in methodology and analytic technique. For example, there are notable differences in [Pagán-Rodríguez's \(2011\)](#) selection criteria for identifying individuals who experienced disability and the selection criteria used by [Lucas \(2007b\)](#). In [Lucas's \(2007b\)](#) study, respondents were included in analyses if they reported experiencing onset of disability during the study and continued to report being disabled for the duration of the study. In contrast, [Pagán-Rodríguez's \(2012\)](#) and [Powdthavee's \(2009\)](#) analyses were limited to respondents who reported experiencing disability during the study—and included both people who remained disabled and those who eventually recovered from their disability. These differences in selection criteria result in important differences in the composition of the sample being evaluated, and it is important to note these differences (among other differences in analytic methods among studies) because they may have implications as to how one should interpret and consolidate findings across studies. It is unclear whether any single technique provides an optimal method for answering the question of how disability affects SWB across time, as this is a relatively new stream of research and the methods for analyzing the major research questions continue to be developed. Indeed, greater consensus regarding the optimal methods for addressing these questions will likely emerge as this research continues to expand.

In light of this variation in findings in this area, there have been recent efforts to synthesize this literature and identify the overall patterns of results across multiple studies. In particular, [Luhmann, Hofmann, Eid, and Lucas \(2012\)](#) conducted a meta-analysis to aggregate the existing life events literature and examine whether life events have differential impact on affect and cognitive aspects of SWB (i.e., life satisfaction) and whether patterns of adaptation differed across various life events. As discussed previously, studies using panel data like the GSOEP and the BHPS indicate that major life events can have strong effects on SWB, and that the strength of these effects and the pattern of adaptation to these events vary from event to event. This meta-analysis offered one of the first empirical evaluations of this observation and extended the test of this notion beyond the commonly used

panel studies. SWB is conceptualized as comprising an affective and cognitive component (Diener, 1984), and it is possible that these aspects of SWB are affected differently by the experience of life events (Diener, Lucas, & Scollon, 2006). One of the strengths of this meta-analysis is that it offers a way to evaluate this question in aggregate across multiple studies using multiple measures of these constructs.

The results of this meta-analysis showed that there are differences in how the experience of major life events impacts affective and cognitive components of SWB. Generally speaking, life events appear to have stronger effects on cognitive aspects of SWB, and these effects appear to be more consistent across various samples. The authors reviewed eight distinct life events in their meta-analysis (unemployment, re-employment, retirement, relocation/migration, marriage, divorce, widowhood, and childbirth) and found that patterns of reaction and adaptation differed across life events. This finding is consistent with observations in previous reviews of the literature (Lucas, 2007b) and indicates that the extent to which major life events affect individuals varies depending on the life event.

## NEW INNOVATIONS IN RESEARCH ON LIFE EVENTS

As research into the role of life events on changes in SWB matures, studies are continuing to become more sophisticated, and new innovations in analytic techniques used to understand the link between life events and SWB continue to be developed. For example, recent research has recognized that past studies of life events did not account for normative age-related changes in SWB. That is, a study may find that unemployment is related to lasting declines in SWB (e.g., Clark et al., 2008), but it remains possible that these declines would be observed in this sample regardless of whether unemployment occurred. Other research has found evidence that individuals' SWB does change over time due to normative, age-related changes across the life span (Baird, Lucas, & Donnellan, 2010; Blanchflower & Oswald, 2008), and if certain life events tend to occur during these periods of change, observed changes (or lack of changes) following major life events may be conflated with normative changes that are typical for the sample being evaluated.

To separate the influence of normative change from change in SWB due to the experience of an event, recent studies (e.g., Yap, Anusic, & Lucas, 2012; Anusic, Yap, & Lucas, in press a; in press b) have begun to estimate and account for the pattern of normative change that would have been observed if a particular sample did not experience the life event being evaluated. To do this, these studies generate matched comparison samples using propensity score matching (Gelman & Hill, 2009). Each comparison group includes individuals who are similar on various demographic characteristics (e.g., sex, age, income, and education) to the sample experiencing the event, but who have not experienced the event themselves. Normative trends in

SWB that are common to both the group that experienced a life event and the comparison group can then be separated from changes in SWB that occur as a result of experience of the life event and that are present in the event group only. This technique allows researchers to evaluate how much change in SWB occurs following a life event over and above the normative, age-related changes that may be observed even if the event had not taken place.

The results of these studies indicate that accounting for normative change is important when considering adaptation to life events and has implications on how results that show adaptation (or lack of adaptation) should be interpreted. For instance, [Yap et al. \(2012\)](#) replicated the findings of past research ([Lucas et al., 2003](#)) that found that marriage was not associated with lasting increases in SWB compared to pre-marriage baseline levels in the BHPS. However, after accounting for normative changes that are experienced by individuals in the nonmarried, matched comparison sample, the data suggest that married individuals are higher in SWB than they would have been if they stayed unmarried and experienced only normative changes over time. Overall, this research suggests that considering normative changes in SWB is important in evaluating the impact of major life events on individual well-being.

Recent work has also recognized and has begun accounting for individual variability in patterns of reaction and adaptation to major life events. Indeed, the experience of major life events can result in substantial changes in individuals' SWB, but past research also indicates that there is substantial variability in how life events affect SWB and the pattern of adaptation over the years that follow (e.g., [Bonanno, 2004](#); [Galatzer-Levy et al., 2010](#); [Galatzer-Levy et al., 2011](#)). It is the case that major life events (even highly negative ones) are associated with little or no change in SWB for many people. For instance, [Galatzer-Levy et al. \(2011\)](#) reported that there is substantial variability in individuals' responses to childbirth, and although other research suggests that childbirth is associated with decreases in SWB on an average level (e.g., [Dyrdal & Lucas, 2013](#)), they find evidence that the majority of parents actually do not experience any lasting change in SWB following childbirth. Similarly, [Lucas et al. \(2003\)](#) found that although on average married individuals adapted back to their pre-marriage baseline levels of SWB, there were substantial cohorts of respondents whose SWB remained above initial baseline in the years that followed marriage, as well as others whose SWB decreased well below their baseline levels over time.

Recent research has begun to identify factors that account for individual variation in how various life events impact SWB (in other words, identifying moderators of these effects). One possible moderator that has been of interest in past literature is the variation in personality traits (e.g., [Dyrdal & Lucas, 2013](#); [Pai & Carr, 2010](#)). For example, a study by [Boyce, Wood, and Brown \(2010\)](#) found that individual differences in conscientiousness moderate the impact of unemployment on SWB, such that individuals higher in conscientiousness

appeared to be more vulnerable to the negative effects of unemployment. A similar study by [Boyce and Wood \(2011\)](#) demonstrated that agreeableness actually had a protective effect against the negative effects of disability. Their results indicated that individuals higher in agreeableness displayed faster and more complete adaptation to the experience of disability.

Although the results of these studies point to Big Five personality traits as a promising explanation to the individual variability in responses to life events, a notable limitation of the studies just described is that they evaluate only one trait and one life event at a time. Other recent research evaluating the role of the Big Five personality traits in how individuals react and adapt to various life events simultaneously has shown that these traits are not consistently associated with variability in responses to life events (e.g., [Anusic et al., in press a; in press b; Yap et al., 2012](#)). Not only did this latter research fail to replicate moderating effects observed in past literature (e.g., [Boyce et al., 2010; Boyce & Wood, 2011; Pai & Carr, 2010](#)), but this research also did not find any consistent pattern indicating that Big Five personality traits generally moderated responses to major life events in nationally representative samples of British and Swiss households. Research has also explored the potential moderating roles of other individual differences (e.g., the role of social support in reaction and adaptation to widowhood; [Anusic & Lucas, in press](#)), but a consistent moderator of change in SWB following major life events is still elusive. Indeed, identifying factors that account for variability in responses to major life events is an important avenue of ongoing research in this area.

## CONCLUSIONS

The question of whether happiness can change is probably the first and most important question that SWB researchers must tackle. Before we can develop theories about the processes underlying well-being and before we can create programs to improve well-being, it would be helpful to have basic descriptive data on the extent to which SWB does, in fact, change over time. Indeed, the surprising results from early studies that addressed this question—results that suggested that happiness does not change—captured the attention of researchers and laypeople alike and shifted attention to personality factors as one of the most important predictors of well-being. Although we, too, believe that the study of personality predictors provides an important method for understanding the processes underlying well-being judgments, we also believe that the conclusions regarding the stability of well-being were overstated.

In this chapter, we reviewed recent research that uses multiwave longitudinal designs to re-evaluate conclusions from earlier studies that used weaker designs. This newer research shows that stability is not so great as to discourage theoretical and applied work that examines the causes of change.

It is true that many specific questions from this research are not yet settled. We do not know with certainty, for instance, whether or not marriage, on average, has a positive causal effect on levels of life satisfaction. The reason is that different models provide somewhat different answers (although the differences are not large), and even the best methods leave some causal questions still open. However, research into the associations between life events and SWB provides relatively strong evidence that some changes—and even some large changes—do occur when people experience major life events.

And perhaps most importantly, the extremely large, multiwave panel studies that have been conducted now allow researchers to estimate, with some degree of precision, the size of long-term test–retest correlations. The results of these studies have been remarkably consistent, and these results show that the stabilities are low enough to suggest that considerable changes do occur on average. Correlations over long periods of time tend to bottom out somewhere between .25 and .30, even though the year-to-year correlations are often between .60 and .70 (which suggests that the weak long-term stabilities are not due to poor reliability). This fact alone should be encouraging to researchers who hope to identify the factors that lead to change.

This evidence does not mean that there are no challenges to be faced in the study of change. For instance, at a population level, change has been quite slow, and it is not clear whether major societal changes lead to similar changes in well-being (e.g., Deaton, 2012; Easterlin, 1995). Similarly, although work on individual-level interventions is progressing, there is still no sure-fire method for creating large and lasting changes in well-being. This may be due to limitations in our theories about the processes underlying well-being, which would mean that the normal progress of science should lead to improvements in these areas. However, there may also be specific mechanisms that make intentional change difficult. Whichever is true, continued and simultaneous research into the extent to which SWB changes and the causes of this change will lead to important advances in knowledge of this highly valued construct.

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