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Can Happiness Change?

The Short- and Long-Term Relationships Between Subjective Well-Being and External Circumstances

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Table of Contents

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Abstract

Subjective well-being (SWB) is a broad construct consisting of peoples' affective and cognitive evaluations of their lives (Diener, 1984). An important theoretical model is the set-point model according to which SWB fluctuates around a stable set point that is determined by heritable factors such as personality (e. g., Brickman, Coates, & Janoff-Bulman, 1978; Headey & Wearing, 1989; Lykken & Tellegen, 1996). According to this model, external life circumstances play a minor role in determining individuals' level of SWB, presumably because people adapt quickly and inevitably to any changes in life circumstances. Recent research, however, indicates that the relevance of external factors for SWB might have been underestimated by this theory (Diener, Lucas, & Scollon, 2006). For instance, specific major life events such as bereavement or unemployment have been shown to lead to lasting decreases in SWB (Lucas, Clark, Georgellis, & Diener, 2003, 2004). This raises the question which external life circumstances can lead to short- or long-term changes in SWB.

In the present dissertation, the short- and long-term relations between SWB and income (Chapter 2), single life events (Chapter 3), and repeated life events (Chapter 4) are examined. These external circumstances have in common that their effects on SWB were for a long time thought to be almost negligible (e. g., Diener, Suh, Lucas, & Smith, 1999; Myers & Diener, 1995). However, previous empirical studies were often misinterpreted. For instance, the correlation between income and SWB is typically around $r = .20$ which may not be a large effect compared to other relationships in psychology, but it nonetheless has practical significance (Lucas & Schimmack, 2009).

In Chapter 2, a study is presented that examined whether the correlation between income and SWB is mainly due to stable individual differences or to occasion-specific influences. Two components of SWB, affective and cognitive well-being, were analyzed in separate models. The association between affective well-being and income was modeled within a sample from the British Household Panel Study (BHPS; $N = 37{,}041$); and the association between cognitive well-being and income was modeled within a sample from the BHPS ($N = 31{,}871$) as well as within a sample from the SOEP ($N = 43{,}565$). To separate stable and occasion-specific influences, bivariate latent state-trait (LST) models were applied to these longitudinal data sets. With these models, it was possible to (a) estimate the correlation among the stable factors that reflect stable individual differences, (b) to estimate the correlation among the occasion-specific factors that reflect transient fluctuations, and (c) to estimate the relative impact of stable and occasion-specific influences on the bivariate association between income and SWB. The study presented in this dissertation is the first to apply bivariate LST models to the relationship between SWB and income. Across the three samples, the correlations between the stable determinants were moderate and the correlations between transient determinants were weak. Stable factors accounted for 60 to 90 % of the total observed covariance between income and SWB. In sum, these

findings indicate that the relation between income and SWB is primarily driven by dispositional factors that need to be examined in more detail in future research.

The adaptation hypothesis is central to the set-point theory of SWB. This hypothesis states that people adapt quickly to any changes in life circumstances. Previous authors estimated that adaptation is complete after only a couple of months (Suh, Diener, & Fujita, 1996). In Chapter 3, the adaptation hypothesis was tested meta-analytically. For this purpose, longitudinal data from 247 publications (396 samples, 992 effect sizes, N = 82,893) on five family events (marriage, divorce, bereavement, child birth, health problems of spouse) and five work events (unemployment, reemployment, retirement, other occupational transitions, relocation/migration) were aggregated. For each event, three central research questions were answered: (1) What is the initial hedonic impact of the event on SWB? (2) What is the average rate and shape of adaptation over time? (3) Do the initial hedonic impact and the rate of adaptation differ for affective well-being and cognitive well-being? The findings indicated that people adapt to most of these events, but adaptation takes longer than previously assumed and the events differ in their specific effects. In addition, differential effects for affective and cognitive well-being were found: Affective well-being was usually more positive than cognitive well-being, suggesting that adaptation might be faster for affective well-being.

In contrast to Chapter 3 which focused on single occasions of life events, the study reported in Chapter 4 investigated whether life events affect individuals differentially when they are experienced repeatedly. Specifically, the effects of repeated unemployment, repeated divorces, and repeated marriages on life satisfaction were examined. The data came from the SOEP that was also used in Chapter 2. The sample sizes were N = 3,350 for unemployment, N = 921 for divorce, and N = 1,950 for marriage. To analyze intraindividual effects and interindividual differences simultaneously, multilevel models were employed. For unemployment, a sensitization pattern was found which means that life satisfaction decreases with each new unemployment experience. For divorce, it was found that mean life satisfaction was significantly higher at the second divorce than it had been at the first divorce, which corresponds to an adaptation pattern. Finally, no differential effects of repeated marriages were found. In addition to these mean effects, several moderator variables that might explain interindividual differences were analyzed. The effects of these variables were most pronounced for neuroticism, extraversion, and gender. For instance, women were on average more satisfied than men in the context of repeated unemployment and in the context of repeated divorces. In sum, these findings showed that repeated occasions of the same event can have very different effects on life satisfaction.

Across all studies, the central findings were: (1) External circumstances affect cognitive well-being to a greater extent than they affect affective well-being. (2) Different life events have very different effects on SWB. (3) External circumstances are partially influenced by the individual dispositions. The disserta-

tion concludes with an integrative discussion. Theoretical, methodological, and practical implications are derived.

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1 INTRODUCTION

Introduction

Judged by the sheer number of self-help books in an average bookstore, happiness is of greatest concern for most people. Book titles like "Happiness is a choice" (Minirth & Meier, 2007) or "Happiness NOW!" (Holden, 2007) suggest that happiness can be reached by anyone and anytime. The proposed pathways to happiness are many and range all the way from daily meditation to buying that fancy convertible car. Whatever pathway works, it seems common sense that we can, to some degree, influence our own well-being.

This common belief was for a long time contradicted by a psychological theory on subjective well-being. Subjective well-being (SWB) is a broad concept that comprises cognitive judgments and affective experiences of a person's life (Diener, 1984) and is often used synonymously to happiness (e. g., Diener, Suh, Lucas, & Smith, 1999). According to a framework model proposed by Lischetzke and Eid (2006; also Eid, 2008), SWB can be further distinguished according to the component (affective vs. cognitive well-being, see Section 1.2.3), the life domain (e. g., general, work, family), and the time frame (habitual trait SWB, momentary state SWB, and situation-specific SWB). For a long time, most SWB researchers believed that we cannot become happier, no matter how hard we try. Getting married or getting divorced, winning the lottery or losing a fortune in a financial crash, getting hired, getting fired, buying that convertible car or wrecking it—none of these events should affect our level of *habitual* SWB for more than a couple of months, and we should be stuck in a hedonic treadmill (Brickman & Campbell, 1971).

This assumption has become known as adaptation-level theory (Brickman & Campbell, 1971), dynamic equilibrium theory (Headey & Wearing, 1989, 1992), and set-point theory (Diener, Lucas, & Scollon, 2006; Lykken & Tellegen, 1996), and became a fundamental part of the SWB framework. In the past few years, however, empirical research has challenged some of its "depressing" (Headey, 2010, p. 8) assumptions. In one study, 25 % of all participants in a representative German panel study reported significant increases or decreases in SWB when very long time spans were considered (Fujita & Diener, 2005). In another study using the same data, the average level of SWB of people who had become unemployed was significantly lower than before unemployment, even when they found a new job (Lucas, Clark, Georgellis, & Diener, 2004). These are just two example of an accumulating body of evidence that indicates that the impact of external circumstances might have been underestimated in the classic set-point theory of SWB (Lucas & Diener, 2008).

The goal of the present dissertation is to investigate the relation between SWB and two important external circumstances: income and major life events. Previous empirical studies on these external factors have often been limited in terms of methodology or interpretation. One illustrative example is the classic study by Brickman, Coates, and Janoff-Bulman (1978) that will be described in more detail below.

The remainder of this introduction consists of a concise summary of the basic assumptions and empirical evidence for the set-point theory of SWB, followed by an overview of the studies that compose this dissertation.

1.1 A Short History of the Set-Point Theory of SWB

In modern psychology, Brickman et al. (1971) were among the first to propose that people adapt to any life circumstances. They presented initial evidence in a study where lottery winners and paraplegic accident victims were compared to a control group that had not recently gone through any major life changes (Brickman et al., 1978). The authors found that lottery winners were not significantly happier than participants in a control group. Moreover, accident victims were happier than it "might have been expected" (Brickman et al., 1978, p. 921) because their happiness scores were still above the midpoint of the scale. Together, these findings seemed to suggest that major life events do not have any lasting effects on SWB, presumably because people adapt very fast. However, a closer look reveals several limitations of the study that question the original interpretation: (a) The sample size was rather small (N = 22 for lottery winners, N = 29 for accident victims, and N = 22 for controls), so weak effects were unlikely to be detected. (b) Despite these relatively small sample sizes, the mean-level difference between accident victims and controls was statistically significant and quite strong in terms of effect size (d = 0.75 as estimated by Diener et al., 2006). (c) The study was cross-sectional, making it impossible to judge whether these differences were caused by the event or whether they had existed before. Nevertheless, this study became a citation classic in psychology and had a huge impact on the understanding of SWB.

A number of subsequent authors have offered explanations for why the habitual level of SWB should not change. For instance, Headey and Wearing (1989, 1992) proposed an extensive theoretical framework linking well-being, ill-being, personality, and life events. They assumed that well-being is in a dynamic equilibrium which means that it fluctuates around a stable baseline level. In addition, they proposed that each person experiences a typical pattern of life events. Only life events that deviate from this typical pattern should affect well-being. Both well-being and life events are associated with personality characteristics: The authors proposed that extraversion, neuroticism, and openness determine the individual baseline level of well-being as well as the individual normal pattern of life events. In sum, this theory was a major extension to the classic adaptation-level theory by Brickman and Campbell (1971) because it (a) accounted for individual differences in well-being and (b) considered the interactive effects between personality and external circumstances. However, one major assumption was not questioned: Over long time spans, people should always return to their baseline level of SWB.

The term *set point* was first introduced by Lykken and Tellegen (1996) to describe the stable baseline of SWB. They suggested that the set point for SWB is very stable, to a large proportion heritable, and almost impossible to change. In their words:

> "If the transitory variations of well-being are largely due to fortune's favors, whereas the midpoint of these variations is determined by the great genetic lottery that occurs at conception, then we are led to conclude that individual differences in human happiness—how one feels at the moment and also how happy one feels on average over time—are primarily a matter of chance." (Lykken & Tellegen, 1996, p. 189)

By the time Diener et al. (1999) published their review on three decades of research on SWB, set-point theory was well established. Empirical evidence on correlates of SWB was usually interpreted in favor of set-point theory. However, as we shall see below, a closer examination of these findings often reveals that the case for set-point theory was not as strong as it might have seemed. Serious doubts on the validity of set-point theory came up when SWB researchers started analyzing large-scale panel data sets, particularly the German Socio-Economic Panel (SOEP; Wagner, Frick, & Schupp, 2007) and the British Household Panel Study (BHPS; Taylor, Brice, Buck, & Prentice-Lane, 2009). These nationally representative panel studies provided multiple annual waves of SWB data, making it possible to track intraindividual changes in SWB over very long time spans. A series of studies on the stability and variability of life satisfaction (Fujita & Diener, 2005; Headey, 2008; Lucas & Donnellan, 2007) and the long-term impact of major life events on life satisfaction (Lucas, 2007a) showed that for some people and under specific circumstances, life satisfaction can change significantly and sustainably.

Based on these findings, Diener and colleagues (2006) proposed several revisions of the classic set-point theory: (1) For most people, the individual set point for SWB is above neutral. (2) People differ in their set points. These individual differences are associated with personality characteristics. (3) SWB is a composite of different affective and cognitive components. People have multiple set points for each of these components, and the components might change independently. (4) Under specific circumstances, happiness can change. (5) People differ in the extent to which they react and adapt to changing life circumstances.

Some authors argue that even these revisions do not account for all of the inconsistent evidence that was accumulated in the past decade, and call for a completely new theory of SWB (Headey, 2010). But just like empirical studies on SWB were for a long time interpreted in favor of set-point theory, researchers must be careful not to reinterpret every piece of new evidence against set-point theory. In the following section, the most important empirical findings in this context are reviewed.

1.2 Empirical Evidence

The premise of the stable set point leads to several implications that can be (and have been) tested empirically: First, SWB should correlate strongly with dispositional variables (e. g., personality) and weakly with demographic variables (e. g., age, marital status). Second, SWB should be relatively stable over long time spans. This implies that changes in external circumstances (e. g., major life events) should not have any long-term effects on SWB.

1.2.1 Correlates of SWB

In one of the first reviews on the correlates of happiness, Wilson (1967) concluded that higher happiness is associated with demographic characteristics such as young age, good health, high education, high income, and being married; as well as with dispositional characteristics such as high extraversion, high optimism, and high self-esteem. Subsequent SWB researchers who examined these and other correlates of SWB typically found high correlations between SWB and personality variables and comparatively low correlations between SWB and demographic variables (for reviews, see Argyle, 2001; Diener et al., 1999; Myers & Diener, 1995).

SWB correlates with a number of personality characteristics (see meta-analysis by DeNeve & Cooper, 1998), the most important ones being extraversion and neuroticism (Lucas, 2008). In one meta-analysis, the big five personality dimensions accounted for at least 18 % of the variance in life satisfaction, 24 % of the variance in positive affect, and 30 % of the variance in negative affect (Steel, Schmidt, & Shultz, 2008). Compared with these figures, external circumstances account for rather small amounts of variance in SWB. The estimates range between 8 and 15 % for demographic variables, and the bivariate correlations between external circumstances and SWB are typically rather low (Argyle, 1999; Diener et al., 1999). Findings like these are often cited as evidence for the set-point theory because they seemingly demonstrate that external circumstances have almost no effect on SWB (e. g., Myers & Diener, 1995). However, this conclusion is not as obvious as it might seem, as will now be illustrated for the example of income and SWB.

The question of whether money can buy happiness is probably one of the oldest in SWB research. The relation between income and SWB has been examined in numerous, mostly cross-sectional studies (for reviews, see Biswas-Diener, 2008; Cummins, 2000; Diener & Biswas-Diener, 2002; Frey & Stutzer, 2001; R. T. Howell & C. J. Howell, 2008). The main finding is consistent across the majority of these studies: The correlation between income and SWB is typically small to moderate. Despite the empirical consistency across studies, the interpretation of this finding varied considerably, from "wealthy people are only *somewhat happier* than poor people" (Diener et al., 1999, p. 288) to "money buys happiness" (Cummins, 2000, p. 133).

These divergent interpretations suggest that the relation between income and SWB might be too complex to be fully captured in cross-sectional correlations. In addition, the interpretation of cross-sectional correlations is not as straightforward as it might seem: First, correlations only describe the linear relationship between two variables. For income and SWB, however, the relation is typically non-linear: The association is stronger for lower income levels and weaker for higher income levels (e. g., R. T. Howell & C. J. Howell, 2008). Second, even small correlations can have substantial practical significance. Lucas and Schimmack (2009) demonstrated this for income and SWB: They showed that even relatively low correlations can reflect significant mean-level differences between people (also Diener, Horwitz, & Emmons, 1985). Finally, cross-sectional correlations only refer to *momentary* differences *between* individuals. It is impossible to infer whether these differences reflect general (i. e., stable) differences between poorer and richer people or whether income changes are related to changes in SWB *within* individuals.

To disentangle these effects, the association between income and SWB must be analyzed simultaneously on the level of stable interindividual differences and on the level of occasion-specific fluctuations. This can only be achieved with longitudinal data. Longitudinal studies on SWB and income were scarce by the time Diener and Biswas-Diener (2002) reviewed the existent literature, but this has changed in the past years: A number of studies using data from the SOEP and the BHPS have been conducted (e. g., Di Tella, Haisken-DeNew, & MacCulloch, 2004; Gardner & Oswald, 2007; Wunder, 2008). However, none of them attempted to separate stable and occasion-specific effects on income and SWB. This gap will be closed in this dissertation. In *Chapter 2*, a longitudinal study will be presented where the effects of stable and occasion-specific factors on the income-SWB relation are examined. The specific aims and the methodological approach are discussed in more detail below.

1.2.2 Stability of SWB

If set-point theory was correct, habitual SWB should be highly stable over time. The stability of SWB can be examined in two ways, (a) by estimating the autocorrelation between two measurements of SWB which reflects the stability of interindividual differences over time, and (b) by tracking the absolute levels of SWB within individuals over time. It is important to note that these approaches relate to different concepts of stability that do not necessarily converge. For instance, a (hypothetical) stability coefficient of $r = 1.00$ indicates that the happiest person at Time 1 is also the happiest person at Time 2, but it does not indicate whether at Time 2, this person is unhappier, equally happy, or happier than at Time 1.

Previous studies on the stability of *interindividual* differences examined very different time lags, ranging from a couple of weeks (e. g., Eid & Diener, 2004; Suh et al., 1996) to 15 years or more (Fujita & Diener, 2005; Lucas & Donnellan, 2006). In one meta-analysis (Schimmack & Oishi, 2005), it was shown that the stability of life satisfaction decreases with increasing time lags between the measurements; but

even for very long time spans, the predicted stability stayed well above $r = .20$ (also Fujita & Diener, 2005). Others examined the stability of SWB with latent state-trait models (Cole, Martin, & Steiger, 2005; Eid, 2008; Steyer, Schmitt, & Eid, 1999). With these models, it is possible to decompose the total variance into stable (trait) and occasion-specific (state) components and to estimate the relative contribution of each of these components to the total variance. Eid and Diener (2004) examined the variability of diverse SWB measures over four weeks. They estimated that stable trait effects accounted for 33 to 47 % of the total variance in mood and 74 to 83 % of the total variance in life satisfaction. These estimates for life satisfaction were replicated in a study covering several years: Lucas and Donnellan (2007) estimated that stable trait effects accounted for 34 to 38% of the total variance, and moderately stable autoregressive effects accounted for additional 29 to 34 %, which means that 63 to 72 % of the total variance is due to moderately or highly stable influences. In sum, these studies indicate that SWB (especially life satisfaction) is moderately stable over time. This finding is consistent with set-point theory.

However, for a more direct test of the set-point theory, SWB levels must be tracked *within* individuals. It is important to note that set-point theory does *not* predict that SWB does not vary at all within individuals. However, it predicts that this variation is occasion-specific and that SWB always returns to its stable baseline level. This assumption can be tested with studies that focus on mean-level changes within individuals. In one study using data from the SOEP, it was found that over a 10-year period, the average (i. e., aggregated) level of life satisfaction decreased significantly for 24 % of the participants and increased significantly for 6 % (Fujita & Diener, 2005). Thus, for most people, life satisfaction was stable, but for a significant minority, it changed. One potential cause of these changes is the experience of major life events. In a series of studies using data from the SOEP and the BHPS, Lucas and his colleagues found that events such as widowhood (Lucas, Clark, Georgellis, & Diener, 2003), unemployment (Lucas et al., 2004), and the onset of disability (Lucas, 2007b) can have lasting negative effects on SWB. These findings pose a serious challenge to the central assumption of set-point theory according to which people adapt to almost any life event within relatively short amounts of time (Lykken & Tellegen, 1996; Suh, Diener, & Fujita, 1996). However, Lucas' (2007a) studies suffer from one limitation: They are based on only two samples, the SOEP and the BHPS. To arrive at a better understanding of adaptation to life events, it is necessary to consider the whole field of research on life events and SWB. To date, such an extensive review on adaptation to life events is still missing. For this reason, longitudinal studies on various family- and work-related events are aggregated meta-analytically in *Chapter 3*. The research questions of this meta-analysis and the methodological procedures will be presented below.

Another open question in research on life events and SWB concerns individual differences in reaction and adaptation: Why do some people adapt fast whereas others do not return to their individual set

points for several years? The multiple factors that might account for these individual differences include dispositional variables such as neuroticism, extraversion, optimism, or habitual coping style, as well as situational variables such as the specific circumstances of the event. A factor that has largely been neglected in previous work on life events and SWB is whether the persons had experienced the event before. Possibly, the reaction to a specific event is different when it is experienced the second or third time in life, compared to the first time. Previous studies on repeated life events typically compared individuals who had experienced the event repeatedly to individuals who had experienced the event only once cross-sectionally (e. g., Cargan & Whitehurst, 1990). Preliminary results from longitudinal studies suggest that previous experiences can explain some of the individual differences in reaction to life events (e. g., Lucas et al., 2004). However, none of these studies compared the reactions to repeated events *within* individuals. In *Chapter 4*, intraindividual differences in reaction to repeated unemployment, repeated divorces, and repeated marriages are examined. This study is the first to examine SWB changes within individuals in the context of repeated life events.

1.2.3 Affective and Cognitive Well-Being

Generally, two major components of SWB are distinguished (Diener, 1984): Affective well-being (AWB) describes the frequency and intensity of emotions and moods. AWB is high for persons who experience frequent positive affect and infrequent negative affect. Cognitive well-being (CWB) refers to the evaluative judgments people make about specific life domains (e. g., job satisfaction) or life overall (global life satisfaction).

Originally, set-point theory (and other theories on SWB) was proposed as a theory of general SWB, which means that it was supposed to apply to all components of SWB alike. In their revision of set-point theory, however, Diener et al. (2006) proposed that each component might have its own set point and change into different directions (see Section 1.1). This proposition is supported by evidence showing that AWB and CWB can be distinguished empirically, differ in their relations to other variables, and differ in their stability and variability over time (e. g., Diener, Kahneman, Arora, Harter, & Tov, 2009; Eid & Diener, 2004; Lucas, Diener, & Suh, 1996; Schimmack, Schupp, & Wagner, 2008).

In the present dissertation, the distinction between these major components of SWB is taken into account. In Chapter 2, the relation between income and AWB as well as the relation between income and CWB are examined. In the meta-analysis in Chapter 3, it is investigated whether different patterns of reaction and adaptation to life events can be found for AWB and CWB. For the study on repeated life events in Chapter 4, only a measure of CWB (i. e., global life satisfaction) was available.

1.2.4 Summary

The central implication of this short review is that the interpretation of previous empirical findings is often quite ambiguous. Most importantly, cross-sectional correlations do not provide a strict test of set-point theory because they only refer to interindividual differences. Set-point theory, however, is a theory that describes stability and variability of SWB within individuals and must therefore be tested with longitudinal data. Recent longitudinal studies (e. g., Fujita & Diener, 2005; Lucas, 2007a) have shown that external circumstances can have substantial effects on SWB that were underestimated by previous accounts. In the light of these findings, Ed Diener demanded "to describe the factors that can alter people's long-term baseline levels of various types of well-being versus those circumstances that only temporarily change people's subjective well-being" (Diener, 2008, p. 496). The present dissertation is part of this line of research.

1.3 The Present Dissertation

The present dissertation consists of three separate studies that examine the associations of income (Chapter 2), single life events (Chapter 3), and repeated life events (Chapter 4) with SWB. As was discussed above, cross-sectional studies are inappropriate to study the short- and long-term relations between external circumstances and SWB. Therefore, all studies in the present dissertation are based on longitudinal data. Besides focusing on different external factors, these studies also differ in their methodological approach: In Chapter 2, data from two long-running representative panel studies (SOEP and BHPS) are analyzed using latent state-trait (LST) models (Eid, 2008; Steyer et al., 1999). In Chapter 3, previous research findings on life events and SWB are aggregated using meta-analytic procedures. Finally, in the study reported in Chapter 4, multilevel modeling techniques are employed to examine the differential effects of repeated life events on SWB. In the next sections, the specific aims and methods for each study will be presented in more detail.

1.3.1 Income and SWB (Chapter 2)

The goal of this study is to examine whether the correlation between income and SWB is mainly due to stable individual differences or to occasion-specific influences. If the correlation between income and SWB was mainly due to stable individual differences, this would suggest that wealthier persons are generally happier, regardless of the momentary circumstances. If, by contrast, the correlation between income and SWB was mainly due to occasion-specific influences, this would indicate that short-term fluctuations of income covary with short-term fluctuations in SWB, possibly because of a causal effect of income changes on SWB.

To study stable and occasion-specific effects simultaneously, longitudinal data covering multiple time points are needed. In Chapter 2, data from two samples from the BHPS (N = 37,041 and N = 31,871, respectively) and one sample from the SOEP (N = 43,565) are analyzed with latent state-trait (LST) models (Eid, 2008; Steyer et al., 1999). These models allow separating stable, autoregressive, and occasion-specific influences and estimating the relative impact of each of these factors on the total variance of a variable. LST models can be extended to analyze bivariate relationships (e. g., Eid & Diener, 2004). It is then possible to determine the relative impact of stable influences (e. g., dispositional variables affecting both income and SWB) and occasion-specific influences (e. g., effects of income changes on SWB changes) on the observed correlation between income and SWB. The study presented in this dissertation is the first to apply LST models to the bivariate relationship between SWB and income.

1.3.2 A Meta-Analysis on Life Events and SWB (Chapter 3)

The effects of life events on SWB have been examined in numerous studies. Most of them did not report findings on adaptation, but rather on very different research questions, which might be why they are rarely cited in the adaptation literature. In Chapter 3, longitudinal studies examining SWB in the context of life events from diverse disciplines are aggregated in a meta-analysis. In total, 247 publications on five family events (marriage, divorce, bereavement, child birth, health problems in spouse) and five work events (unemployment, reemployment, retirement, other occupational transitions, and relocation/migration) were included. These publications yielded 992 effect sizes from 396 samples (N = 82,893). The analyses are guided by three major research questions: (1) What is the initial hedonic impact of each event on SWB? (2) What is the average rate and shape of adaptation over time? (3) Do the initial hedonic impact and the rate of adaptation differ for affective well-being and cognitive well-being? The effect sizes are analyzed using mixed-effects meta-analytic models (Borenstein, Hedges, Higgins, & Rothstein, 2009).

1.3.3 Repeated Life Events (Chapter 4)

Almost all previous longitudinal studies on specific life events and SWB focused on single occasions of these events (cf. Chapter 3). The goal of the final study of this dissertation is to explore the effects of *repeated* life events on SWB. Three hypothetical patterns are proposed: According to the adaptation pattern, the impact of the second event on SWB is weaker than the impact of the first event. According to the sensitization pattern, the impact of the second event on SWB is stronger than the impact of the first event. Finally, no differences in the impact of the repeated events might be observed.

In Chapter 4, the differential effects of repeated unemployment, repeated marriages, and repeated divorces are examined. For this purpose, data from three subsamples of the SOEP (N = 3,350 for unemployment, N = 921 for divorce, and N = 1,950 for marriage) are analyzed using multilevel modeling

(Singer & Willett, 2003). With multilevel models, intraindividual changes and interindividual differences can be analyzed simultaneously. In the study presented in Chapter 4, it is therefore possible to examine whether moderators such as age, gender, or personality account for any differences in the reaction to repeated life events.

1.3.4 General Discussion (Chapter 5)

In Chapter 5, the findings of the single studies will be summarized and integrated with respect to their theoretical and practical implications. The dissertation will conclude with an outlook on future research on external circumstances and SWB.

1.4 References

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2 Stable and Transient Determinants of the Relationship Between Subjective Well-Being and Income

Luhmann, M., Schimmack, U., & Eid, M. (2010). *Stable and transient determinants of the relationship between subjective well-being and income.* Manuscript in revision.

Abstract

Empirical studies typically find a moderate positive correlation between income and subjective well-being (SWB). In the present paper, we examined this correlation on the interindividual and the intraindividual level by analyzing the stable and transient determinants of income and SWB within a single statistical model. Specifically, we analyzed the relation between affective well-being and income in the British Household Panel Study (BHPS; N = 37,041) and the relation between cognitive well-being and income in the BHPS (N = 31,871) and the Socio-Economic Panel (SOEP; N = 43,565) with bivariate latent state-trait models. The main results were: (a) Correlations between the stable determinants were moderate, explaining stable interindividual differences in income and SWB. (b) Correlations between transient determinants were weak, suggesting that short-term changes in income are weakly related to short-term changes in SWB. (c) Stable determinants accounted for 60 to 90 % of the total observed covariance between income and SWB. In sum, the findings show that the correlation between income and SWB is mostly driven by dispositional variables which need to be considered in future theories and research.

Keywords: subjective well-being, income, structural equation modeling, latent state-trait models

Stable and Transient Determinants of the Relationship Between Subjective Well-Being and Income

For centuries, people have wondered about the relationship between income and subjective well-being (SWB), and extensive theoretical debates and numerous empirical investigations on this topic have been initiated (for reviews, see Biswas-Diener, 2008; Cummins, 2000; Diener & Biswas-Diener, 2002; Frey & Stutzer, 2001; R. T. Howell & C. J. Howell, 2008). Two main findings have been replicated repeatedly: First, the cross-sectional correlation between income and SWB is typically small to moderate (e. g., Diener & Biswas-Diener, 2002; Diener & Oishi, 2000; Dolan, Peasgood, & White, 2008; Lucas & Schimmack, 2009). In the World Values Survey, the mean correlation between income and life satisfaction across 19 nations was $r = .18$ (Diener & Oishi, 2000). This coefficient might seem small in comparison to other effects typically found in psychological research. However, even small correlation coefficients can reflect significant mean-level differences between people (Diener, Horwitz, & Emmons, 1985; Lucas & Schimmack, 2009).

Second, the shape of the relationship tends to be non-linear, a phenomenon named "diminishing marginal utility" in the economic literature (e. g., Easterlin, 2005): The association between income and SWB is stronger in the low-income range and weaker in the high-income range. In the cross-cultural study by Diener and Oishi (2000), the correlation between income and SWB was somewhat higher in poorer nations. In a recent meta-analysis, the average correlation between income and SWB was $r = .28$ in low-income developing countries and $r = .13$ in high-income developing countries (R. T. Howell & C. J. Howell, 2008).

In sum, these findings provide convincing evidence that income and SWB are related: Most researchers agree today that at a given moment in time, richer individuals tend to be happier than poorer individuals (e. g., Biswas-Diener, 2008; Frey & Stutzer, 2001; Lucas & Schimmack, 2009). However, it is crucial to keep in mind that this finding only describes the relation between *momentary* SWB and *momentary* income. That is, it is not clear whether a single measurement of SWB reflects an individual's typical level of SWB or a short-term deviation from this typical level. Applied to income and SWB, this means that cross-sectional correlations can be interpreted in at least two ways: (a) Richer people are generally happier, for instance because stable dispositional variables affect both income and SWB in similar ways. (b) Changes in income cause changes in SWB. If this second interpretation was right, money could in fact buy happiness.

These two interpretations describe the relation between income and SWB on two different levels: the interindividual level and the intraindividual level. The interindividual level reflects stable differences *between* individuals whereas the intraindividual level reflects short-term fluctuations *within* individuals.

Both levels contribute to the observed value of a variable at a specific point of time. One way to disentangle these levels is to decompose the observed variable into stable components (reflecting the effects of stable differences on the interindividual level) and transient components (reflecting the effects of transient determinants on the intraindividual level; Eid, 2008). The distinction between stable and transient components offers a new perspective on the variability of psychological constructs over time. For instance, SWB is regarded as a variable that fluctuates around a rather stable baseline (sometimes called set-point; Diener, Lucas, & Scollon, 2006). This baseline reflects interindividual differences in habitual SWB and is reflected in the stable components of the variable. The fluctuations occur on the intraindividual level and are reflected in the transient components of the variable (Eid & Diener, 2004; Lucas & Donnellan, 2007).

The distinction between stable and transient components can be extended to explain the covariance between variables. It is possible to examine the covariance of the stable components and the covariance of the transient components separately and to evaluate how much each of them contributes to the total observed covariance. In less technical terms, this means that it is possible to evaluate the relative impact of stable and transient determinants on the relation of two variables, for instance, the relation between income and SWB.

2.1 Overview of the Present Paper

Although some previous theories acknowledge that stable differences between individuals might affect the income-SWB link (e. g., values and goals, Kasser & Ryan, 1993, 1996; Kasser, Ryan, Couchman, & Sheldon, 2004; Schmuck, Kasser, & Ryan, 2000; Solberg, Diener, & Robinson, 2004), an integrative model that considers both stable and transient effects is still missing. This is also reflected in most empirical studies where stable individual differences are at most statistically controlled, but rarely interpreted directly (e. g., Andreß & Bröckel, 2007). The present paper is the first to consider stable individual differences and transient fluctuations of income and SWB simultaneously. The analyses were guided by the following research questions:

1. How strong is the association between income and SWB on the level of stable differences?
2. How strong is the association between income and SWB on the level of transient differences?
3. What is the relative contribution of stable and transient determinants to the observed correlation between income and SWB?

To answer these questions, we will decompose the covariance between income and SWB into its stable and transient components by applying latent state-trait models (Eid, 2008; Eid & Diener, 2004; Steyer,

Schmitt, & Eid, 1999) to large-scale longitudinal data sets. To test whether the correlation between income and SWB reflects stable individual differences (interindividual level), the correlation between the stable components will be examined. To test whether changes in income are related to changes in SWB (intraindividual level), the correlations among the transient components will be examined. Finally, we will estimate the relative impact of the stable and transient determinants on the observed covariance between income and SWB by decomposing this covariance into its components.

Our study extends previous work in several theoretical and methodological aspects: First, our study is the first to separate stable and transient determinants between SWB and income within a single model. Second, we will consider both affective well-being (i. e., negative affect) and cognitive well-being (i. e., life satisfaction). Affective well-being (AWB) and cognitive well-being (CWB) are distinct components of SWB that differ in their associations with other predictor and outcome variables (Diener, Suh, Lucas, & Smith, 1999; Schimmack, Schupp, & Wagner, 2008). Previous work suggests that the association between CWB and income might be stronger than the association between AWB and income (Diener, Kahneman, Arora, Harter, & Tov, 2009). However, the preponderance of previous studies on income and SWB examined cognitive well-being. Finally, our study is the first to apply latent state-trait models to the correlation between income and SWB. The basic idea of these models is presented below.

2.2 Method

2.2.1 Samples

We analyzed samples from two large-scale, nationally representative panel studies. In both studies, the data were collected on an annual basis. Sample 1 came from the British Household Panel Study (BHPS; Taylor, Brice, Buck, & Prentice-Lane, 2009) that had started in 1991. For AWB, we analyzed 16 waves (1991 to 2006; Sample 1a). Life satisfaction was only assessed from wave 6 to wave 10 (1996 to 2000) and from wave 12 to wave 16 (2002 to 2007), therefore we only used these ten waves in the analyses of CWB (Sample 1b). All individuals who had provided information on income and SWB in at least one of these waves were included. Sample sizes were N = 37,041 for Sample 1a (50.4 % female; age in 1991: M = 32.3, SD = 21.1; years of participation: M = 6.0, SD = 3.1) and N = 31,871 for Sample 1b (50.5 % female; age in 1996: M = 36.5, SD = 20.8; years of participation: M = 6.1, SD = 2.9).

Sample 2 came from the German Socio-Economic Panel (SOEP; Wagner, Frick, & Schupp, 2007). This panel study started in 1984. For the purpose of our study, we analyzed data from 19 waves (1990 to 2008). We did not include data from the first six waves of the study (1984 to 1989) because the covariance coverage for these early waves was less than 10 %. Sufficient covariance coverage is needed to analyze the data using full information maximum likelihood. The final sample size was N = 43,565

(50.8 % female; age in 1990: *M* = 33.7, *SD* = 19.0; years of participation: *M* = 7.8, *SD* = 5.8). The number of participants providing data is reported separately for each wave in Table 2.1 (Sample 1a), Table 2.2 (Sample 1b) and Table 2.3 (Sample 2).

Table 2.1. Descriptive findings for Sample 1a.

			GHQ [a]		Log-income		
Wave	**GHQ [a] Parcel**	***N*** [b]	***M***	***SD***	***M***	***SD***	***r*** [c]
1991	A	8715	1.94	0.45	4.95	0.63	–.13
	B	8715	1.86	0.41			–.14
1992	A	8266	1.96	0.46	5.01	0.65	–.10
	B	8263	1.89	0.44			–.11
1993	A	7950	1.96	0.47	5.06	0.64	–.10
	B	7961	1.88	0.44			–.12
1994	A	7952	1.96	0.46	5.08	0.64	–.06
	B	7962	1.89	0.45			–.09
1995	A	7716	1.97	0.48	5.15	0.64	–.07
	B	7710	1.90	0.46			–.08
1996	A	8039	1.97	0.47	5.20	0.63	–.10
	B	8035	1.90	0.46			–.11
1997	A	9546	1.97	0.49	5.21	0.65	–.08
	B	9550	1.91	0.47			–.09
1998	A	9398	1.96	0.48	5.25	0.64	–.08
	B	9393	1.90	0.46			–.09
1999	A	12990	1.95	0.48	5.25	0.65	–.10
	B	13005	1.90	0.46			–.10
2000	A	13128	1.98	0.48	5.33	0.62	–.09
	B	13129	1.92	0.47			–.11
2001	A	15202	1.97	0.48	5.37	0.62	–.09
	B	15195	1.92	0.47			–.09
2002	A	13090	1.96	0.48	5.43	0.63	–.10
	B	13056	1.91	0.46			–.10
2003	A	12980	1.95	0.47	5.47	0.62	–.09
	B	12950	1.90	0.46			–.10
2004	A	12409	1.95	0.48	5.52	0.62	–.08
	B	12377	1.91	0.47			–.08
2005	A	12368	1.96	0.48	5.55	0.61	–.09
	B	12350	1.92	0.47			–.09
2006	A	11987	1.95	0.48	5.61	0.59	–.09
	B	11976	1.92	0.48			–.10

Notes. [a] GHQ = General Health Questionnaire (Goldberg, 1992). Higher values indicate lower well-being. [b] Number of participants who provided data for both variables in this wave. [c] Cross-sectional correlations between the GHQ parcels and income.

Table 2.2. Descriptive findings for Sample 1b.

		Life satisfaction		Log-income		
Wave	***N*** [a]	***M***	***SD***	***M***	***SD***	***r*** [b]
1996	8090	5.24	1.32	5.20	0.62	.07
1997	9566	5.23	1.34	5.21	0.62	.07
1998	9381	5.31	1.26	5.26	0.63	.07
1999	13025	5.21	1.35	5.26	0.65	.11
2000	13050	5.17	1.31	5.33	0.63	.09
2002	13091	5.25	1.30	5.43	0.62	.07
2003	13004	5.28	1.29	5.47	0.61	.06
2004	12468	5.24	1.28	5.52	0.60	.07
2005	12374	5.18	1.29	5.55	0.61	.08

Notes. [a] Number of participants who provided data for both variables in this wave. [b] Cross-sectional correlations between life satisfaction and income.

The SOEP and the BHPS have been used in previous studies on income and SWB. We will now shortly review these studies to show how our paper extends previous work. Most SOEP studies on income and SWB focused on specific questions such as the relative impact of absolute versus relative income on life satisfaction (e.g., d'Ambrosio & Frick, 2007; Ferrer-i-Carbonell, 2005; e.g., Layard, Mayraz, & Nickell, 2009, see above) or the relation between income and life satisfaction in specific subgroups, for instance, East Germans vs. West Germans, migrants, or divorced people (Andreß & Bröckel, 2007; Easterlin & Zimmermann, 2008; Frijters, Haisken-DeNew, & Shields, 2004). Others examined lagged effects of earlier income on later life satisfaction (Di Tella, Haisken-DeNew, & MacCulloch, 2004; Wunder, 2008) but did not separate the effects on the individual and intraindividual level. Using the BHPS, Gardner and Oswald (2007) found that SWB of lottery winners (assessed with the General Health Questionnaire; D. Goldberg, 1992) was increased over the following two years. DeVoe and Pfeffer (2009) compared the effect of income on SWB for people who were paid by the hour to people who received a non-hourly salary and found that the effect of income on well-being was stronger for the former group.

The evidence from previous studies using the SOEP or the BHPS can be summarized as follows: (1) Across all studies, there was a positive relationship between income and SWB. (2) Most studies analyzed multiple waves from the SOEP or the BHPS, but only few explicitly examined change processes. (3) None of these studies separated stable and transient components and examined their correlation. Thus, these data have not yet been analyzed with respect to the relative strength of transient and stable determinants.

Table 2.3. Descriptive findings for Sample 2.

		Life satisfaction		Log-income		
Wave	***N*** [a]	***M***	***SD***	***M***	***SD***	***r*** [b]
1990	13440	7.05	1.88	6.64	0.51	.20
1991	13038	6.95	1.90	6.74	0.48	.27
1992	12852	6.91	1.82	6.84	0.45	.26
1993	12611	6.88	1.89	6.92	0.45	.24
1994	12851	6.86	1.85	6.95	0.45	.22
1995	13033	6.89	1.83	7.00	0.43	.20
1996	12838	6.90	1.78	7.03	0.42	.20
1997	12751	6.79	1.79	7.04	0.41	.20
1998	13843	6.95	1.78	7.07	0.42	.21
1999	13405	6.97	1.78	7.11	0.42	.21
2000	22772	7.09	1.78	7.13	0.44	.21
2001	21051	7.11	1.74	7.16	0.43	.22
2002	22577	7.05	1.74	7.32	0.54	.27
2003	21273	6.96	1.78	7.29	0.53	.26
2004	20797	6.80	1.83	7.30	0.53	.25
2005	19965	6.95	1.83	7.29	0.53	.29
2006	20859	6.91	1.80	7.30	0.53	.28
2007	19764	6.95	1.78	7.33	0.52	.28
2008	18530	6.98	1.75	7.35	0.52	.25

Notes. [a] Number of participants who provided data for both variables in this wave. [b] Cross-sectional correlations between life satisfaction and income.

2.2.2 Measures

Affective Well-Being

AWB was only assessed in the BHPS by means of a 12-item version of the General Health Questionnaire (GHQ-12; D. Goldberg, 1992). The GHQ has often been used as a measure of AWB (e. g., Lucas, 2007). Individuals are asked to rate whether they have recently experienced specific symptoms (e. g., feelings of unhappiness, enjoyment of day-to-day activities) on a four-point scale ranging from 1 (*more so than usual*) to 4 (*much less than usual*). For our structural equation analyses, the 12 items were randomly assigned to two item parcels. The item parcel scores were calculated by averaging the six respective item scores. The average estimated reliability of these indicators was .87 (range: .79 to .92; see *Table 2.5*). Higher scores reflect lower AWB.

Cognitive Well-Being

Ratings of global life satisfaction were used as measures of CWB. In the BHPS, life satisfaction was assessed with a single item ("How dissatisfied or satisfied are you with your life overall?"). Ratings were

made on a 7-point scale ranging from 1 (*not satisfied at all*) to 7 (*completely satisfied*). A score of 4 indicates neutral satisfaction (*not satisfied/dissatisfied*). In the SOEP, life satisfaction was also assessed with a single item ("How satisfied are you with your life, all things considered?"). Ratings were made on an 11-point scale ranging from 0 (*totally dissatisfied*) to 10 (*totally satisfied*). In both the BHPS and the SOEP, higher scores reflect higher CWB.

It was not possible to estimate the reliability of these single-item indicators within our models. In one previous study, the reliability of life satisfaction in the SOEP was estimated in longitudinal structural equation models (Schimmack, Krause, Wagner, & Schupp, 2010). The authors report an average reliability coefficient of .63 which can be considered as adequate for a single-item measure. No estimate is available for life satisfaction in the BHPS.

Income

Household net income was a derived variable that included all sources of income (e. g., labor income, investment income, pensions) minus local taxes. In the BHPS, income is expressed as British Pounds per week. In the SOEP, income is expressed as Euros per month. To account for the fact that bigger households have higher regular expenditures (e. g., more food, more rent), we divided income by the square root of household size. This procedure is called equalizing and is usually performed in economic studies to get a more adequate measure of the amount of money available per individual household member (e. g., d'Ambrosio & Frick, 2007).[1]

2.2.3 Data Analysis

To model stable and transient determinants within a single statistical model, we applied advanced structural equation models to longitudinal data. In these latent state-trait (LST) models (Eid, 2008; Eid & Diener, 2004; Steyer et al., 1999), the total observed variance is decomposed into variance components reflecting the stability of the construct, variance components reflecting the variability of the construct, and measurement error. To illustrate the basic ideas of latent state-trait models, we begin with some general assumptions concerning the stability and variability of psychological constructs.

Basic Ideas of LST Models

The stability of psychological constructs is typically examined using autocorrelations, that is, the correlation of the construct measured at Time 1 with the same construct measured at Time 2 (Walls & Schafer, 2006). The time lag between these time points can vary. If the construct was perfectly stable, the observed autocorrelations would be very high and would differ from 1 only because of measure-

[1] We also ran all analyses with non-equalized income. The results did not differ substantively.

ment error. If the construct was perfectly instable, the autocorrelations would be close to zero. These two extreme patterns are very rare in psychology. For most constructs, we observe that the magnitude of the autocorrelation is a function of the time lag: As we increase the lag between the time points, the autocorrelations decrease. In theory, the autocorrelations could eventually become zero-correlations which would mean that if the time lag between two measurements is long enough, it is impossible to predict the variation of the construct at the later time point from its variation at the earlier time point. In other cases, the relation between the magnitude of the autocorrelations and the time lag is non-linear: Beyond a certain time lag, the decrease of the autocorrelations approaches an asymptote. This asymptote signals the existence of a stable component of the construct. Even over very long time spans, it is possible to predict some of the variation at the later time point from its variation at the earlier time point.

So far we have discussed two determinants of stability: the effect of the stable component (e. g., habitual SWB) and the autoregressive effect that explains why the stability of the construct decreases with increasing time lag. These two effects do not, however, account for all the variability that we observe: The remaining unexplained variance at each time point can be further decomposed into a random component (e. g., measurement error) and a systematic or occasion-specific component (e. g., deviation of momentary SWB from habitual SWB).

Decomposing the variance into these components gives way to further analyses. First, it is possible to calculate the proportion of variance explained by each of these components (Eid, 2008). Lucas and Donnellan (2007) applied latent state-trait models to data from the SOEP and the BHPS and found that 34 to 38 % of the variance in SWB ratings was due to stable variance and 29 to 34 % of the variance was due to autoregressive effects. Second, it is possible to relate each of these components to other variables. These bivariate models are useful for both methodological (e. g., to assess to construct validity of a construct as done by Eid & Diener, 1999) and substantive research objectives. For instance, Eid and Diener (2004) showed that the correlations between the stable components of life satisfaction and mood were much higher than the correlations between the occasion-specific components of these constructs, suggesting that the effect of mood on judgments of life satisfaction might be much smaller than previously assumed (Schwarz & Strack, 1999). Using data from the SOEP, Schimmack et al. (2010) examined the correlation between aggregated domain satisfaction ratings and a single global life satisfaction rating. Both the correlations between the stable components and between the transient components were very high, suggesting that these variables are affected by the same determinants.

In sum, LST models allow quantifying the degree of stability and variability of a construct and relating these components to other variables. Until today, LST models have only been applied to psychological constructs. The present paper is the first to examine the covariation between a psychological construct (SWB) and a non-psychological construct (income) with these models. Several variants of latent state-

trait models have been proposed (Cole, Martin, & Steiger, 2005; Eid, 2008; Fraley & Roberts, 2005; Kenny & Zautra, 1995). We will now briefly compare these variants and then choose the models that are suited best for our data.

Univariate TSO Model for Multiple Indicators

In latent state-trait (LST) models, the observed variance is decomposed into a stable component (trait)[2], a variable component (state), and measurement error (Steyer, Ferring, & Schmitt, 1992; Steyer et al., 1999). The latent trait-state-occasion (TSO) model (Cole et al., 2005) is an extension of the original LST model that includes autoregressive effects (see Figure 2.1). In this model, the observed variable Y_{it} (e. g., observed CWB, observed income) of indicator i at occasion t is decomposed into a stable factor T, an occasion-specific factor O_t, and measurement error E_{it}:

$$Y_{it} = \lambda_{T_{it}} \cdot T + \lambda_{O_{it}} \cdot O_t + E_{it}$$

The stable factor T represents stable individual differences. The occasion-specific factor O_t comprises all influences that are due neither to the stable factor nor to measurement error. The occasion-specific factor O_t for $t > 1$ is further decomposed into an autoregressive component $O_{(t-1)}$ and a "pure" occasion-specific component R_t:

$$O_t = \beta_{t(t-1)} \cdot O_{t-1} + R_t$$

giving the combined equation

$$\begin{aligned} Y_{it} &= \lambda_{T_{it}} \cdot T + \lambda_{O_{it}} \cdot (\beta_{t(t-1)} \cdot O_{t-1} + R_t) + E_{it} \\ &= \lambda_{T_{it}} \cdot T + \lambda_{O_{it}} \cdot \beta_{t(t-1)} \cdot O_{t-1} + \lambda_{O_{it}} \cdot R_t + E_{it} \end{aligned}$$

[2] In the context of latent state-trait models, the *trait factor* is defined as the common factor of all observations over time. This definition differs from the definition usually found in personality psychology where traits are typically defined as stable variables that can, nonetheless, change over time (e. g., Roberts & Mroczek, 2008). To avoid confusion on these different trait concepts, we will not use the term trait but use the term *stable factor* or *stable component* instead.

The "pure" occasion-specific component R_t represents those occasion-specific influences that are predictable neither by the stable factor nor by previous occasions of measurement.

This model can be extended in several ways. First, we can add 2nd order autoregressive effects of $O_{(t-2)}$. Second, we can add an indicator-specific factor (dotted lines in Figure 2.1). This factor explains common variance in one of the indicators (here: one of the two item parcels) that cannot be explained by the stable factor and is unique to this indicator. In our study, we will test these two extensions empirically. We will include the additional effects only if they improve the fit of the model significantly.

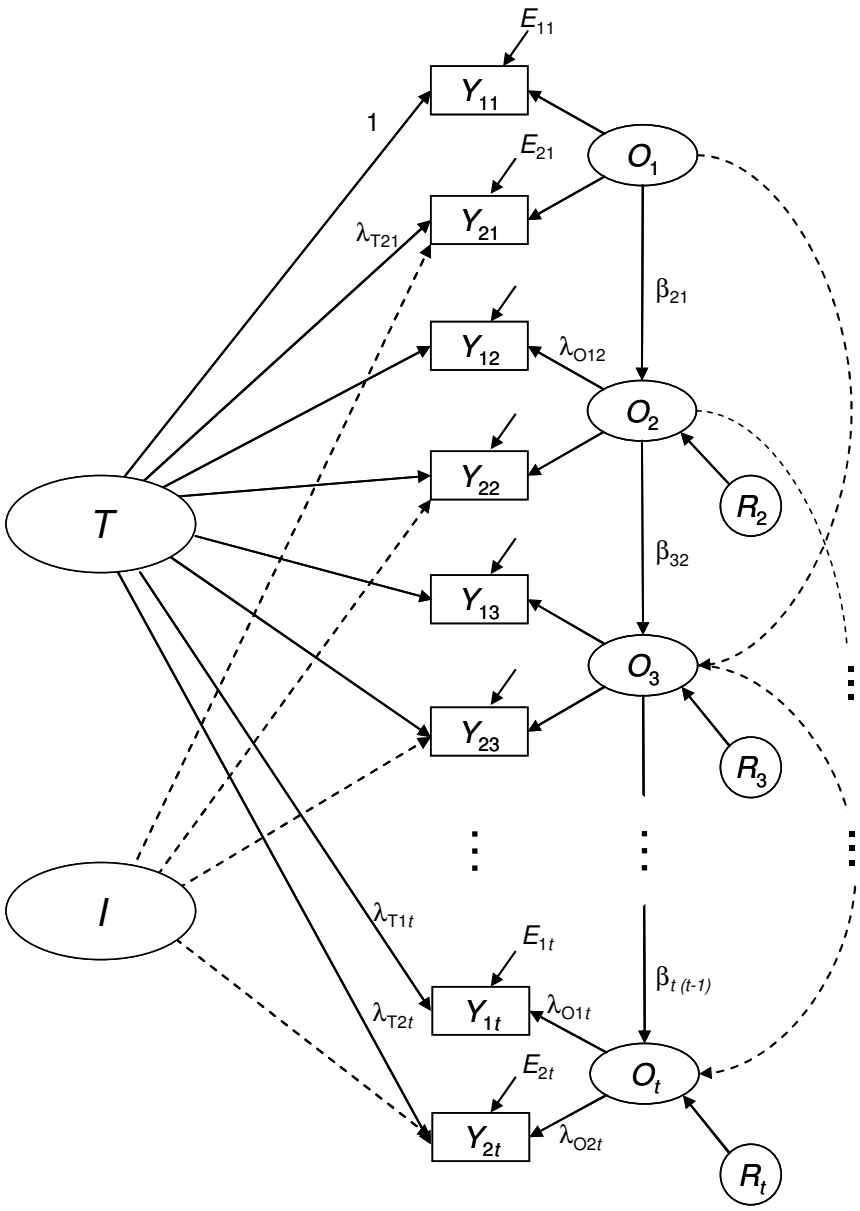

Figure 2.1. Univariate latent state-trait model for two indicators with 1st and 2nd order autoregressive effects.

Y_{it} denotes the manifest indicator i at time t, T denotes the stable factor; I denotes the indicator-specific factor that is included to improve the model fit; O_t denotes the occasion-specific factors; R_t denotes the "pure" occasion-specific residual factor, and E_{it} denotes the measurement error.

Univariate TSO Model for Single Indicators

In our study, the TSO model can be used to model variability in AWB because this variable was assessed with multiple indicators. However, for the other variables of interest in our study (i. e., income and CWB), only single indicators were available. Therefore, it is necessary to modify the TSO model.

Kenny and Zautra (1995) proposed the stable trait (ST), autoregressive trait (ART), and state (S) model (STARTS; also known as trait-state-error model). Similarly to the TSO model, the observed variance is decomposed into a stable (trait) component, an autoregressive component, and a state component that contains both occasion-specific effects and measurement error. In contrast to the TSO model, the STARTS model has been formulated explicitly for single indicators. The STARTS model requires stationarity, that is, invariance of loadings and variance components over time. These assumptions are often violated when the STARTS model is applied to variables measured over very long time periods, for instance because societal changes can distort the stability of the process. Indeed, the authors admit that the STARTS model "can be difficult to fit" (Kenny & Zautra, 2001, p. 248). The STARTS model has been applied successfully to SWB in the SOEP and the BHPS (Lucas & Donnellan, 2007; Schimmack et al., 2010; Schimmack & Lucas, in press), but for income, we encountered problems with the strict stationarity assumption.

Therefore, we used a slightly modified version of the STARTS model in our analyses (Figure 2.2). In contrast to the STARTS model, the path coefficients of the occasion-specific factors are fixed to 1 and the residuals of the observed indicators are fixed to zero. Thus, the observed variable Y_t at occasion t is decomposed into a stable factor T and an occasion-specific factor O_t.

$$Y_t = \lambda_{T_t} \cdot T + 1 \cdot O_t$$

Note that compared to the TSO model for multiple indicators, the interpretation of the occasion-specific factor O_t has changed: It is now a residual factor that contains both occasion-specific effects and measurement error. The occasion-specific factor O_t for $t > 1$ is further decomposed into an autoregressive component and a "pure" occasion-specific component R_t:

$$O_t = \beta_{t(t-1)} \cdot O_{t-1} + R_t \quad ,$$

giving the combined equation

$$Y_t = \lambda_{T_t} \cdot T + \beta_{t(t-1)} \cdot O_{t-1} + R_t \ .$$

Similarly to the TSO model for multiple indicators, the occasion-specific residual component R_t represents those occasion-specific influences that are predictable neither by the stable factor nor by previous occasions of measurement. However, it is now confounded with measurement error. Again, 2nd autoregressive effects can be added to this model, and variance components can be calculated.

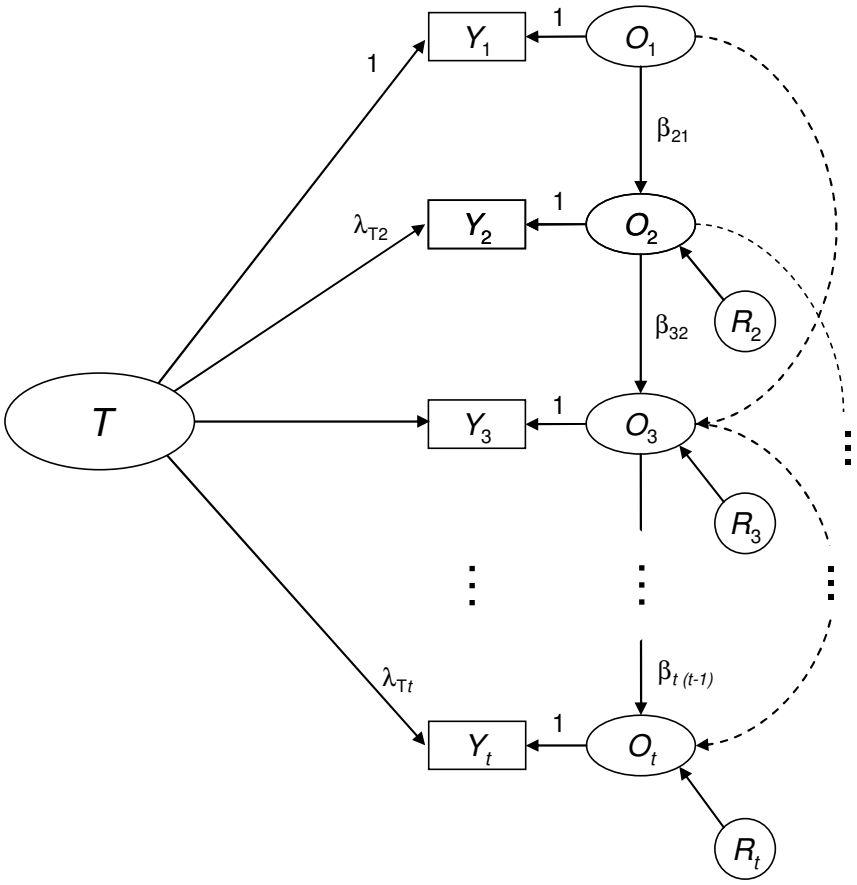

Figure 2.2. Univariate latent state-trait model for single indicators with 1st and 2nd order autoregressive effects.
Y_t denotes the single manifest indicator at time t; T denotes the stable factor; O_t denotes the residual factors that include both systematic occasion-specific variance and measurement error; and R_t denotes the residual variance.

Bivariate TSO Model

Once the best univariate model for each variable has been identified, we integrate these models into a bivariate model (Figure 2.3). In this model, the relation between income and SWB is modeled on various levels. First, the stable factors are correlated, giving us an estimate for the latent correlation between the stable components of income and SWB. Second, the occasion-specific factors are correlated within each wave. These correlation coefficients represent the relation between short-term fluctuations in income and short-term fluctuations in SWB, controlling for stable and autoregressive effects on each variable. A positive correlation would indicate that transient increases in income are associated with transient increases in SWB. Of course, one cannot make any inferences about the causal direction of this effect. Finally, it is possible to include cross-lagged effects in the model, that is, the effect of income at occasion t–1 on SWB at occasion t, and the effect of SWB at occasion t–1 on income at occasion t. In our study, we will compare models without cross-lagged effects to models with cross-lagged effects. The model with cross-lagged effects will be chosen if it fits the data significantly better than the more restrictive and more parsimonious model without cross-lagged effects.

The analyses were conducted with Mplus 5.2. Full information maximum likelihood (FIML) estimation was employed to account for missing values. The amount of missing values is quantified with the covariance coverage, that it, the proportion of participants who provided data for a specific variance or covariance. In Sample 2, the covariance coverage fell below 10 % if all 26 waves were analyzed. Therefore, the first waves (1984 to 1989) were excluded. Average covariance coverage rates in were 22 % in Sample 1a (range 11 % to 56 %), 30 % in Sample 1b (range 16 % to 56 %), and 27 % in Sample 2 (range 12 % to 59 %). The sample sizes for each wave are reported in Table 2.1, Table 2.2, and Table 2.3.

Decomposition of Variances and Covariances

In latent state-trait models, the total observed variance of a variable can be decomposed into various variance components; that is, into variance accounted for by stable influences, variance accounted for by autoregressive effects, and so forth. It is then possible to calculate the proportion of the total variance that is accounted for by each of these components (for formulas, see Eid, 2008; Steyer et al., 1999). It is also possible to decompose the total observed covariance in a similar way, that is, into the proportion of the covariance accounted for by stable components, the proportion of the covariance accounted for by occasion-specific components, and the proportion of the covariance accounted for by autoregressive and cross-lagged effects. The covariance decomposition for the single-indicator bivariate model is derived in the Appendix.

In sum, these coefficients indicate the relative strength of stable and transient determinants in the univariate and bivariate models. The variance and covariance components are calculated separately for

each time point. In the present paper, we will report the average variance and covariance components across all time points.

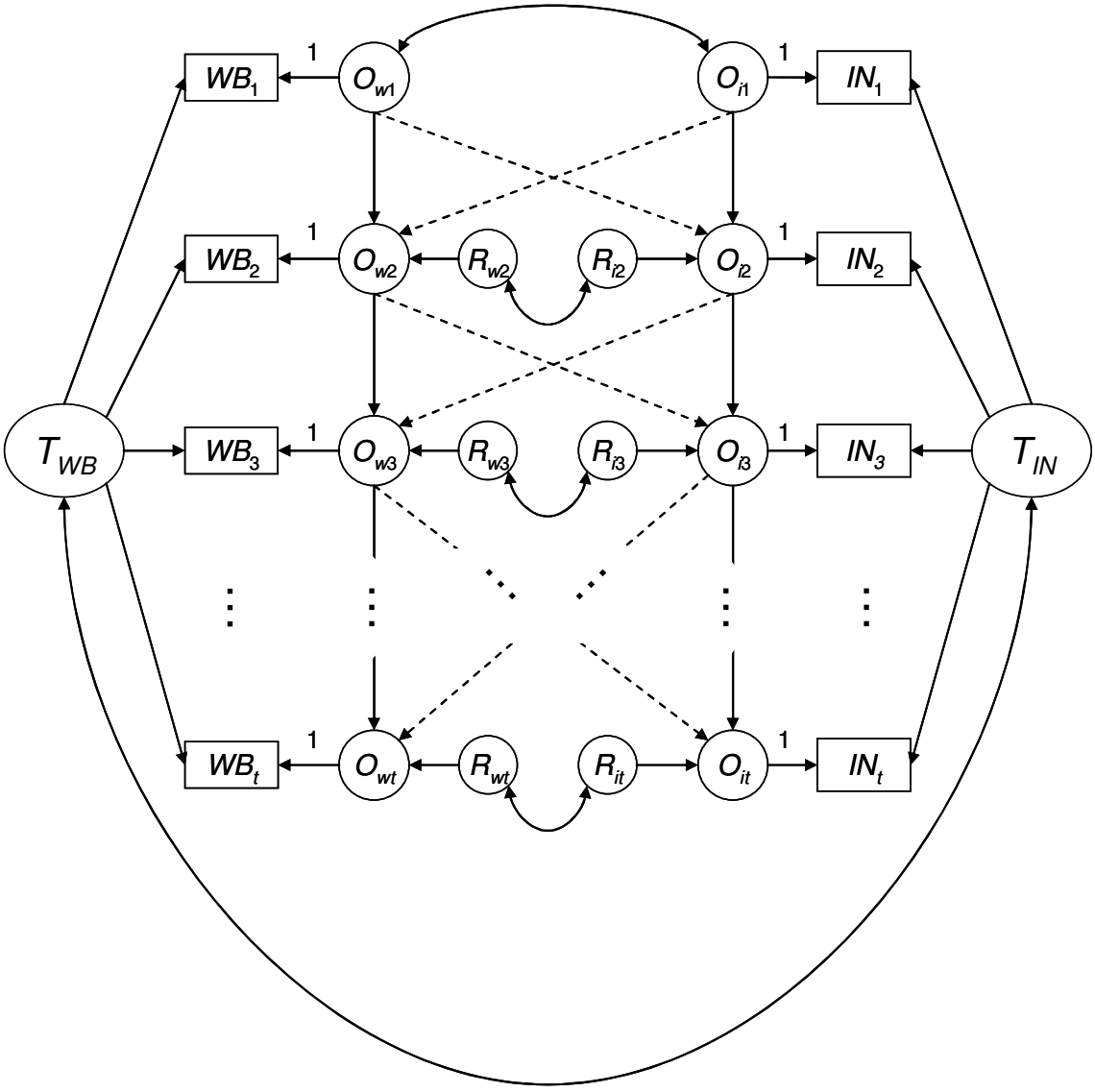

Figure 2.3. Bivariate latent state-trait model for single indicators with 1st order autoregressive effects and cross-lagged effects. WB_t denotes the single manifest indicator of SWB at time t; T_{WB} denotes the stable factor of SWB; O_{wt} denotes the residual factors of SWB that include both systematic occasion-specific variance and measurement error; and R_{wt} denotes the residual variance of SWB at time t. Similarly, IN_t denotes the single manifest indicator of income at time t; T_{IN} denotes the stable factor of income; O_{it} denotes the residual factors of income that include both systematic occasion-specific variance and measurement error; and R_{it} denotes the residual variance of income at time t. To simplify the figure, 2nd order autoregressive effects are not shown.

2.3 Results

2.3.1 Descriptive Findings

Observed means, standard deviations and correlation coefficients are presented in Table 2.1 (Sample 1a), Table 2.2 (Sample 1b), and Table 2.3 (Sample 2). The median cross-sectional correlation between log-transformed income and the GHQ parcels (Sample 1a) was $r = –.09$ (range –.14 to –.06). As high GHQ scores indicate low AWB, this means that higher income was moderately associated with better AWB. The cross-sectional correlations between log-transformed income and CWB in Sample 1b were in a similar range (median $r = .08$, range .06 to .11). In Sample 2, the cross-sectional correlations were somewhat higher. Here, the median correlation was $r = .24$ (range .20 to .29).

2.3.2 Preliminary Analyses

The goal of the preliminary analyses was to evaluate and compare different models and to identify the model with the best fit. The strategy was the same for each of the three samples: (1) identification of the best univariate model for income, (2) identification of the best univariate model for SWB, (3) identification of the best bivariate model for income and SWB. The fit indices of all tested models are reported in Table 2.4.[3]

Univariate Models for Income

To identify the best univariate model for income, we compared models where income was log-transformed to models where income was not log-transformed. By the means of log-transformation, the distribution of a variable is shrunk at the high end and stretched at the low end. Almost all studies that use income measures take the natural logarithm of income (e. g., Clark, Frijters, & Shields, 2008). There are two reasons for this: First, the relation between income and SWB is typically non-linear, that is, the correlation between income and SWB is stronger in the lower income range and weaker in the higher income range. Second, the distribution of income is typically positively skewed, that is, there are more individuals with low incomes than individuals with high incomes. By log-transforming the income variable, the distribution approaches normality. In our study, log-transforming income improved the model fit significantly. For Sample 2, we even found that the models using non-transformed income did not converge. Consequently, we used log-transformed income in all subsequent models.

[3] Due to limited workspace capacity, missing values were deleted listwise during the preliminary analyses. The final models reported below were analyzed using full information maximum likelihood to make full use of all participants.

We also compared models with 1st order autoregressive effects to models with 1st and 2nd order autoregressive effects. Including 2nd order autoregressive effects led to a significant increase in model fit in all samples.

Univariate Models for Cognitive Well-Being

To identify the best univariate model for CWB, we compared a model with 1st order autoregressive effects to a model with 1st and 2nd order autoregressive effects. In all samples, the more complex model with 2nd order autoregressive effects was superior in terms of model fit.

Univariate Model for Affective Well-Being

The univariate model for AWB (Sample 1a) differed from the univariate models for the other variables because AWB was measured by two manifest indicators (see Figure 2.1 and methods section). The model fit was improved by adding an indicator-specific factor. Similarly to the other univariate models, we also compared a model with 1st order autoregressive effects to a model with 1st and 2nd order autoregressive effects. Again, the fit of the model with 2nd order autoregressive effects was significantly better.

Bivariate Models

In the next step, the final univariate models were integrated into bivariate models. Again, two alternative models were tested. We compared a model without cross-lagged effects to a model with cross-lagged effects. These models were estimated using FIML and compared by means of the likelihood ratio test. For all samples, the model with cross-lagged effects fitted significantly better than the model without cross-lagged effects ($p < .001$).

In sum, our preliminary analyses yielded three similar models for the three samples. In these models, autoregressive effects of 1st and 2nd order were included, and cross-lagged effects were allowed. The final models fitted the data very well (see Table 2.4). In the remainder of the results section, we will only report the estimates of these final models.

Table 2.4. Overview of fit indices.

Model	χ^2	*df*	*CFI*	*TLI*	*AIC*	*BIC*	*RMSEA*	*SRMR*	*N*
Sample 1a									
1	improper solution								3402
1a	1231.63	401	.991	.989	36915.48	37890.49	.03	.03	3402
2a	916.31	387	.995	.993	36628.16	37689.02	.02	.02	3402
3	2732.30	89	.937	.916	649107.65	649492.64	.09	.05	3331
4	1386.73	89	.967	.956	57076.64	57461.64	.07	.04	3331
5	435.97	75	.991	.986	56153.88	56624.43	.04	.02	3331
6	3039.61	957	.996	.995	480213.58	482488.36	.01	.02	37041
7	2973.48	927	.996	.995	480207.45	482737.83	.01	.02	37041
Sample 1b									
1	373.90	26	.985	.975	127971.57	128223.33	.05	.02	4700
2b	85.13	20	.997	.994	127694.80	127985.28	.03	.01	4700
3	1210.04	26	.964	.938	593189.06	593441.20	.10	.04	4746
4	662.39	26	.979	.964	55393.69	55645.83	.07	.03	4746
5	190.04	20	.995	.988	54933.34	55224.27	.04	.01	4746
6	545.90	129	.997	.995	605500.50	606345.81	.01	.02	31871
7	503.62	113	.997	.995	605490.21	606469.44	.01	.01	31871
Sample 2									
1	1750.41	251	.951	.942	189968.53	190533.53	.05	.05	2224
2	849.29	228	.980	.973	189113.41	189809.67	.04	.03	2224
3	no convergence								
4	2823.98	251	.957	.949	2815.42	3375.54	.07	.06	2117
5	993.45	228	.987	.983	1030.88	1721.13	.04	.03	2117
6	3686.35	575	.994	.993	1306646.59	1308417.72	.01	.02	43565
7	3034.67	539	.995	.994	1306066.91	1308150.59	.01	.02	43565

Notes. Model 1 = Univariate model for SWB, 1st order autoregressive effects. Model 1b = Univariate model for GHQ, 1st order autoregressive effects, with indicator variable. Model 2a = Univariate model for GHQ with indicator factor, 1st and 2nd order autoregressive effects. Model 2b = Univariate model for life satisfaction with 1st and 2nd order autoregressive effects. Model 3: Univariate model for linear income with 1st order autoregressive effects. Model 4: Univariate model for log-income with 1st order autoregressive effects. Model 5: Univariate model for log-income with 1st and 2nd order autoregressive effects. Model 6: Bivariate model without cross-lagged effects. Model 7: Bivariate model with cross-lagged effects. In models 1-5, missing values were listwise deleted due to limited workspace capacity. Models 6 and 7 were estimated with Full Information Maximum Likelihood (FIML).

2.3.3 Variance Components

The average variance components are given in Table 2.5. The average proportion of the stable variance component was higher for CWB (46.95 % in Sample 1b and 40.80 % in Sample 2) than for AWB (33.55 %; Sample 1a). This finding confirms that CWB is more stable than AWB. Most of the remaining variance was residual variance (occasion-specific variance and measurement error). Autoregressive effects and cross-lagged effects accounted for very little variance. AWB was measured by multiple indicators; therefore, occasion-specific variance and residual variance can be separated. For this model, the amount of residual variance reflects the amount of unreliability. In our study, the average residual variance in Sample 1a was 12.67 %, thus, the average estimated reliability of the manifest indicators was .87.

With respect to income, the average proportion of stable variance was highest in Sample 2 (57.03 %). It was somewhat lower in Sample 1a (43.91 %) and Sample 1b (46.68 %). First-order autoregressive effects accounted for some additional variance (on average: 8.20 % in Sample 1a, 5.72 % in Sample 1b, 9.60 % in Sample 2). In sum, income was more stable than SWB. This effect was most pronounced in Sample 2 where occasion-specific effects only accounted for 28.74 % of the observed variance on average.

Table 2.5. Average variance components.

	Subjective well-being			**Income**		
Variance component	**Sample 1a**	**Sample 1b**	**Sample 2**	**Sample 1a**	**Sample 1b**	**Sample 2**
Stable variance %	33.55	46.95	40.80	43.91	46.68	57.03
Indicator-specific variance %	1.93					
1st order autoregressive variance %	3.08	1.72	3.28	8.20	5.72	9.60
2nd order autoregressive variance %	0.47	0.42	0.87	1.01	0.86	1.18
Cross-lagged variance %	0.03	0.03	0.17	0.01	0.01	0.02
Occasion-specific variance %	47.77	50.54	53.69	44.64	45.35	28.74
Residual Variance %	12.67					

Notes. Sample 1a and Sample 1b were drawn from the BHPS; Sample 2 was drawn from the SOEP. Subjective well-being was assessed as affective well-being in Sample 1a and as cognitive well-being in Samples 1b and 2. Income was log-transformed and equalized prior to the analysis.

Table 2.6. Standardized path coefficients of cross-lagged effects.

	SWB regressed on income			Income regressed on SWB		
Waves	**Sample 1a**	**Sample 1b**	**Sample 2**	**Sample 1a**	**Sample 1b**	**Sample 2**
1991 on 1990			0.16***			0.02**
1992 on 1991	0.00		0.10***	–0.02		0.02**
1993 on 1992	–0.01		0.05***	–0.01		0.00
1994 on 1993	0.03*		0.03**	–0.01		0.03**
1995 on 1994	0.05**		0.01	–0.01		0.03**
1996 on 1995	0.03*		0.02	–0.02		0.01
1997 on 1996	–0.01	0.01	0.02*	0.00	0.00	0.03***
1998 on 1997	0.04**	0.00	0.03*	–0.02	0.02*	–0.01
1999 on 1998	–0.01	0.06***	0.00	0.00	0.00	0.01
2000 on 1999	0.04**	0.00	–0.01	–0.01	0.01	0.00
2001 on 2000	0.01		0.01	0.00		0.00
2002 on 2001	0.00		0.02	–0.01		0.01
2003 on 2002	0.02	–0.04**	0.00	–0.01	–0.02	0.01
2004 on 2003	0.00	–0.01	0.01	–0.01	–0.02	0.02
2005 on 2004	0.00	0.01	0.04***	–0.01	0.01	0.03***
2006 on 2005	–0.01	0.02*	0.05***	–0.01	0.01	0.03***
2007 on 2006			0.06***			0.03***
2008 on 2007			0.04***			0.03***
Mean	0.01	0.01	0.03	–0.01	0.00	0.02
Median	0.00	0.00	0.03	–0.01	0.00	0.02

Notes. Sample 1a and Sample 1b were drawn from the BHPS; Sample 2 was drawn from the SOEP. Subjective well-being was assessed as affective well-being in Sample 1a and as cognitive well-being in Samples 1b and 2. Income was log-transformed and equalized prior to the analysis.

*** $p < .001$, ** $p < .01$, * $p < .05$.

2.3.4 Cross-Lagged Effects

The cross-lagged effects of income on SWB accounted for very small amounts of the total variance of SWB (0.03 % on average in Sample 1a and Sample 1b, 0.17 % on average in Sample 2; see Table 2.5). Moreover, the standardized path coefficients were very small (see Table 2.6). In Sample 1a and Sample 1b, most of these coefficients were non-significant. In Sample 2, 8 out of 18 cross-lagged effects were non-significant ($p > .05$). Similar results were found for the cross-lagged effects of SWB on income, that is, the variance components and the path coefficients were very small. These findings suggest that although the model fit is increased by adding cross-lagged effects, the practical significance of these effects is rather small.

Table 2.7. Correlations among occasion-specific components within measurement occasions.

Wave	Sample 1a	Sample 1b	Sample 2
1990			.14***
1991	–.09***		.11***
1992	–.04**		.08***
1993	–.05***		.09***
1994	–.03*		.11***
1995	–.01		.08***
1996	–.05***	.04**	.07***
1997	–.04**	.04***	.08***
1998	–.02	.03*	.06***
1999	–.02*	.05***	.07***
2000	–.03*	.03**	.07***
2001	–.02*		.07***
2002	–.05***	–.01	.06***
2003	–.03*	.00	.07***
2004	–.02*	.02*	.07***
2005	–.04***	.04***	.09***
2006	–.03**	.04***	.08***
2007			.09***
2008			.07***
Mean	–.04	.03	.08
Median	–.03	.03	.08

Notes. Sample 1a and Sample 1b were drawn from the BHPS; Sample 2 was drawn from the SOEP. Subjective well-being was assessed as affective well-being in Sample 1a and as cognitive well-being in Samples 1b and 2. Income was log-transformed and equalized prior to the analysis.

*** $p < .001$, ** $p < .01$, * $p < .05$.

2.3.5 Correlations Among the Latent Factors

The correlation between the stable factors of CWB and income was $r = .13$ in the BHPS and $r = .39$ in the SOEP. For GHQ, the correlation was $r = –.18$. The estimated correlation coefficients for the occasion-specific factors are reported in Table 2.7. The average size of these correlations was quite small: For AWB and income, the average correlation was $r = –.04$ (range: –.09 to –.01). For CWB and income, the average correlation was $r = .03$ (range: –.01 to .05) in Sample 1b and $r = .08$ (range: .06 to .14) in Sample 2. As can be seen in Table 2.7, most (though not all) of the correlation coefficients were significantly different from zero.

2.3.6 Covariance Components

To quantify the relative impact of stable and occasion-specific factors on the total covariance between income and SWB, we decomposed the observed covariance into its components and estimated the proportion to which each of them contributes to the total covariance (see Appendix). On average, the covariance of the stable factors accounted for 89.9 % of the total covariance in Sample 1a (occasion-specific factors: 9.3 %; autoregressive and cross-lagged effects: 0.9 %), 59.5 % in Sample 1b (occasion-specific factors and measurement error: 28.6 %; autoregressive and cross-lagged effects: 11.9 %), and 69.2 % in Sample 2 (occasion-specific factors and measurement error: 14.9 %; autoregressive and cross-lagged effects: 15.9 %). This shows that most of the observed covariance between income and SWB can be explained by stable determinants.

2.3.7 Additional Analyses

One shortcoming of our models was that CWB (Sample 1b and Sample 2) was measured by single indicators. Hence, occasion-specific effects and measurement error were confounded in these models, and the true correlation between the occasion-specific effects might be underestimated. By contrast, AWB was measured by multiple indicators, allowing the separation of measurement error and true transient effects. To assess whether the single-indicator models underestimates the true correlations, we reran the analyses for AWB, now using a single-indicator model instead of a multiple-indicator model. The estimates of the single-indicator model differed only slightly from those in the multiple-indicator model: The mean correlation of the occasion-specific factors was now $r = –.03$ (range: –.08 to –.01), compared to $r = –.04$ (range: –.09 to –.01) in the multiple-indicator model, suggesting that measurement error did not affect the estimates substantively.

2.4 Discussion

At a given point of time, people with higher income tend to report higher subjective well-being scores (e. g., R. T. Howell & C. J. Howell, 2008). In the present paper, we examined this relation on the level of stable and transient differences separately. Our findings indicate that the correlation between SWB and income is primarily driven by stable determinants. The correlations between the stable components of SWB and income were much higher than the correlations between the occasion-specific components. Moreover, a large proportion of the total covariance between income and SWB could be explained by the effects of the stable components: the average proportion was 59.5 % for CWB and income in the BHPS, 69.2 % for CWB and income in the SOEP, and 89.9 % for AWB and income in the BHPS.

Despite the positive cross-sectional correlation between income and SWB, longitudinal studies often find that changes in income are only weakly or not at all correlated with changes in SWB (Marks & Fleming, 1999; Schyns, 2001). Our study suggests that the correlation between income and SWB is mainly caused by stable determinants. Although the transient components were non-zero, their relative impact on the income-SWB correlation was much smaller in comparison, suggesting that changes of income affect SWB to a small degree. Our findings also provide an explanation for another finding that has been reported in recent studies: Various authors found positive cross-lagged correlations between earlier SWB and later income (Diener & Biswas-Diener, 2002; Graham, Eggers, & Sukhtankar, 2004; Lyubomirsky, King, & Diener, 2005; Marks & Fleming, 1999). One possible explanation for this effect is the existence of unobserved stable dispositions that drive the correlation between income and SWB. The influence of these stable factors can produce a correlation between SWB and income even if income is not a cause of SWB.

In contrast to SWB, the variability of income has not previously been examined with LST models. According to our findings, the stability of income is comparable to the stability of CWB in the British sample. In the German sample, the stability of individual differences in income is even higher: the stable component accounts for 56 % of the total variance in income. In addition, autoregressive effects account for an additional 10 % of the total variance in the German sample. Thus, income is a construct of considerable short-term and long-term stability. Practically, this means that richer people are likely to stay rich, and poorer people are likely to stay poor in comparison to others, even over very long time spans. Especially in Germany, it is quite hard to move up on the income scale.

2.4.1 Implications

The main finding of this study is that stable determinants can explain most of the covariance between income and SWB. The existence of stable individual differences has rarely been considered in previous

theoretical accounts and much less been examined in empirical studies. Based on our findings, we argue the future research must strive to identify those stable dispositional variables that share common variance with both income and SWB.

For instance, more research on the effects of personality characteristics on income and SWB is probably fruitful: Numerous studies have shown that personality variables such as extraversion and neuroticism are related to SWB (DeNeve & Cooper, 1998; Lucas, 2008). Specifically, people high in extraversion and low in neuroticism tend to be happier than people low in extraversion and high in neuroticism. Personality variables also account for differences in occupational attainment which is correlated with income (Roberts, Kuncel, Shiner, Caspi, & L. R. Goldberg, 2007). For instance, negative correlations of neuroticism and negative emotionality with occupational attainment and positive correlations of extraversion and positive emotionality with occupational attainment have been found (Judge, Higgins, Thoresen, & Barrick, 1999; Roberts, Caspi, & Moffitt, 2003). Thus, one reason for the correlation between the stable components of income and SWB might be that both constructs are affected by the same personality variables. Dispositional variables might affect income and SWB in more indirect ways as well. For instance, the effect of income changes on SWB changes might depend on the individual salience of material goals and values (Kasser & Ryan, 1993; Kasser et al., 2004; Schmuck et al., 2000): The effect should be stronger for someone who sees making money as an important life goal than for someone who sees leading a humble life as a major value. In addition, the joint effects of different (sometimes competing) life goals and values should be considered. Most people pursue multiple goals that might have differential effects both on income and SWB. An interesting research question would be to examine the additive and interactive effects of multiple life goals on income and SWB.[4]

2.4.2 Future Studies

Apart from investigating potential stable influences of income and SWB, future studies should also examine whether our findings generalize to other time frames and cultural contexts. In the present study, the time lag between the measurement occasions was 12 months. This allowed us to analyze the relation between income and SWB on a very general level; however, very short-term changes of income and SWB could not be examined. An interesting objective for future studies would be the application of LST models to longitudinal income data with shorter time lags, for instance, in order to investigate reaction and adaptation processes after singular changes in income (e. g., adaptation to a pay raise).

Another venue for future studies concerns cross-cultural differences. We know that cross-sectional correlations between income and SWB vary considerably between nations (Diener & Biswas-Diener,

[4] Thanks to an anonymous reviewer who suggested this point.

2002; R. T. Howell & C. J. Howell, 2008), but national differences in the relative impact of stable and transient determinants have yet to be investigated. The present paper is a starting point. Our analyses used data sets from two nationally representative panel studies. The association between income and SWB was much stronger in the German sample, on the level of stable components as well as on the level of transient components. It is unclear whether these differences can be attributed to true cultural differences or to methodological differences in the data collection. Both life satisfaction and income were measured somewhat differently in the British and the German sample, and it is not clear whether these measures are completely comparable. Also, respondents in the BHPS and the SOEP might use different criteria when they judge their life satisfaction. The present paper was not intended as a cross-cultural study, thus inferences about cultural differences should be made with caution. To examine cultural differences between Germany, Great Britain, and other nations, the relation between stable and transient components of income and SWB should be examined in multiple data sets using comparable measures of SWB and income.

2.4.3 Conclusion

The present paper was guided by three central research questions which can be answered as follows: (a) The association between income and SWB on the level of stable differences is moderately positive. (b) The association between income and SWB on the level of transient differences is positive as well, but much weaker than the correlation on the stable level. (c) Stable determinants account for most of the covariance between income and SWB. Together, these findings suggest that richer people are generally happier than poorer people. Money can buy happiness, but only some.

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2.6 Appendix to Chapter 2

2.6.1 Decomposition of covariance components for the bivariate model with single indicators

To decompose the observed covariance $Cov(X_t , Y_t)$ between the manifest indicator of Variable X at Time t and the manifest indicator of Variable Y at time t, the regression equations for the two manifest indicators are needed:

$$X_t = \lambda_{xt} \cdot T_x + 1 \cdot O_{xt} \quad .$$

The regression equation for O_{xt} is given by

$$O_{xt} = \beta_{xt(t-1)} \cdot O_{x(t-1)} + \beta_{xt(t-2)} \cdot O_{x(t-2)} + \gamma_{xt} \cdot O_{y(t-1)} + R_{xt} \ ,$$

where $\beta_{xt(t-1)} \cdot O_{x(t-1)}$ denotes the 1st order autoregressive effect, $\beta_{xt(t-2)} \cdot O_{x(t-2)}$ denotes the 2nd order autoregressive effect, $\gamma_{xt} \cdot O_{y(t-1)}$ denotes the cross-lagged effect, and R_{xt} denotes the residual. The combined regression equation for X_t is

$$X_t = \lambda_{xt} \cdot T_x + \beta_{xt(t-1)} \cdot O_{xt(t-1)} + \beta_{xt(t-2)} \cdot O_{xt(t-2)} + \gamma_{xt} \cdot O_{y(t-1)} + R_{xt} \quad .$$

The regression equation for Y_t is parallel to the one for X_t. In the next step, the covariance between X_t and Y_t is rewritten with these regression equations:

$$\begin{aligned} &Cov(X_t, Y_t) \\ &= Cov(\lambda_{xt} \cdot T_x + \beta_{xt(t-1)} \cdot O_{xt(t-1)} + \beta_{xt(t-2)} \cdot O_{xt(t-2)} + \gamma_{xt} \cdot O_{y(t-1)} + R_{xt}, \\ &\lambda_{yt} \cdot T_y + \beta_{yt(t-1)} \cdot O_{yt(t-1)} + \beta_{yt(t-2)} \cdot O_{yt(t-2)} + \gamma_{yt} \cdot O_{x(t-1)} + R_{yt}) \end{aligned}$$

In the next step, this equation is solved:

$$
\begin{aligned}
&Cov(X_t, Y_t) \\
&= \lambda_{xt} \cdot \lambda_{yt} \cdot Cov(T_x, T_y) + \lambda_{xt} \cdot \beta_{yt(t-1)} \cdot Cov(T_x, O_{yt(t-1)}) + \lambda_{xt} \cdot \beta_{yt(t-2)} \cdot Cov(T_x, O_{yt(t-2)}) \\
&+ \lambda_{xt} \cdot \gamma_{yt} \cdot Cov(T_x, O_{x(t-1)}) + \lambda_{xt} \cdot Cov(T_x, R_{yt}) \\
&+ \beta_{xt(t-1)} \cdot \lambda_{yt} \cdot Cov(O_{xt(t-1)}, T_y) + \beta_{xt(t-1)} \cdot \beta_{yt(t-1)} \cdot Cov(O_{xt(t-1)}, O_{yt(t-1)}) \\
&+ \beta_{xt(t-1)} \cdot \beta_{yt(t-2)} \cdot Cov(O_{xt(t-1)}, O_{yt(t-2)}) + \beta_{xt(t-1)} \cdot \gamma_{yt} \cdot Cov(O_{xt(t-1)}, O_{x(t-1)}) + \beta_{xt(t-1)} \cdot Cov(O_{xt(t-1)}, R_{yt}) \\
&+ \beta_{xt(t-2)} \cdot \lambda_{yt} \cdot Cov(O_{xt(t-2)}, T_y) + \beta_{xt(t-2)} \cdot \beta_{yt(t-1)} \cdot Cov(O_{xt(t-2)}, O_{yt(t-1)}) \\
&+ \beta_{xt(t-2)} \cdot \beta_{yt(t-2)} \cdot Cov(O_{xt(t-2)}, O_{yt(t-2)}) + \beta_{xt(t-2)} \cdot \gamma_{yt} \cdot Cov(O_{xt(t-2)}, O_{x(t-1)}) + \beta_{xt(t-2)} \cdot Cov(O_{xt(t-2)}, R_{yt}) \\
&+ \gamma_{xt} \cdot \lambda_{yt} \cdot Cov(O_{y(t-1)}, T_y) + \gamma_{xt} \cdot \beta_{yt(t-1)} \cdot Cov(O_{y(t-1)}, O_{yt(t-1)}) + \gamma_{xt} \cdot \beta_{yt(t-2)} \cdot Cov(O_{y(t-1)}, O_{yt(t-2)}) \\
&+ \gamma_{xt} \cdot \gamma_{yt} \cdot Cov(O_{y(t-1)}, O_{x(t-1)}) + \gamma_{xt} \cdot Cov(O_{y(t-1)}, R_{yt}) \\
&+ \lambda_{yt} \cdot Cov(R_{xt}, T_y) + \beta_{yt(t-1)} \cdot Cov(R_{xt}, O_{yt(t-1)}) + \beta_{yt(t-2)} \cdot Cov(R_{xt}, O_{yt(t-2)}) \\
&+ \gamma_{yt} \cdot Cov(R_{xt}, O_{x(t-1)}) + Cov(R_{xt}, R_{yt})
\end{aligned}
$$

The trait factors are uncorrelated with all occasion-specific factors and residual. In addition, the occasion-specific factors and residuals are uncorrelated. Therefore, the equation reduces to

$$
\begin{aligned}
&Cov(X_t, Y_t) \\
&= \lambda_{xt} \cdot \lambda_{yt} \cdot Cov(T_x, T_y) \\
&+ \beta_{xt(t-1)} \cdot \gamma_{yt} \cdot Cov(O_{xt(t-1)}, O_{x(t-1)}) \\
&+ \gamma_{xt} \cdot \beta_{yt(t-1)} \cdot Cov(O_{y(t-1)}, O_{yt(t-1)}) \\
&+ Cov(R_{xt}, R_{yt})
\end{aligned}
\quad .
$$

Dividing this equation by the observed covariance gives the covariance components. The proportion of the observed covariance due to stable factors is

$$\frac{\lambda_{xt} \cdot \lambda_{yt} \cdot Cov(T_x, T_y)}{Cov(X_t, Y_t)} \quad .$$

The proportion of the observed covariance due to occasion-specific factors is

$$\frac{Cov(R_{xt}, R_{yt})}{Cov(X_t, Y_t)}$$

The remaining covariance is due to autoregressive and cross-lagged factors:

$$\frac{\beta_{xt(t-1)} \cdot \gamma_{yt} \cdot Var(O_{x(t-1)}) + \gamma_{xt} \cdot \beta_{yt(t-1)} \cdot Var(O_{y(t-1)})}{Cov(X_t, Y_t)}$$

2.6.2 Decomposition of covariance components for the bivariate model with multiple indicators

The indicator X_t is measured by single indicators as above, therefore the regression equation is again

$$X_t = \lambda_{T_{xt}} \cdot T_x + \beta_{xt(t-1)} \cdot O_{x(t-1)} + \beta_{xt(t-2)} \cdot O_{x(t-2)} + \gamma_{xt} \cdot O_{y(t-1)} + R_{xt}$$

where $\beta_{xt(t-1)} \cdot O_{x(t-1)}$ denotes the 1st order autoregressive effect, $\beta_{xt(t-2)} \cdot O_{x(t-2)}$ denotes the 2nd order autoregressive effect, $\gamma_{xt} \cdot O_{y(t-1)}$ denotes the cross-lagged effect, and R_{xt} denotes the residual. The indicator Y_{it} is measured by multiple indicators *i,* therefore the regression equation is

$$Y_{it} = \lambda_{T_{yit}} \cdot T_y + \lambda_{I_{yit}} \cdot I_y + \lambda_{O_{yit}} \cdot O_{yt} + E_{yit}$$

where $\lambda_{T_{yit}} \cdot T_y$ denotes the effect of the stable trait factor, $\lambda_{I_{yit}} \cdot I_y$ denotes the effect of the indicator-specific factor, $\lambda_{O_{yit}} \cdot O_{yt}$ denotes the effect of the occasion-specific factor, and E_{yit} denotes the measurement error of indicator *i* at time *t*. The occasion-specific factor can itself be expressed as a regression equation which is similar to the regression equation for O_{xt} in the single-indicator model:

$$O_{yt} = \beta_{yt(t-1)} \cdot O_{y(t-1)} + \beta_{yt(t-2)} \cdot O_{y(t-2)} + \gamma_{yt} \cdot O_{x(t-1)} + R_{yt} \quad ,$$

The combined regression equation for Y_{it} is

$$\begin{aligned} Y_{it} &= \lambda_{T_{yit}} \cdot T_y + \lambda_{I_{yit}} \cdot I_y + \lambda_{O_{yit}} \cdot (\beta_{yt(t-1)} \cdot O_{y(t-1)} + \beta_{yt(t-2)} \cdot O_{y(t-2)} + \gamma_{yt} \cdot O_{x(t-1)} + R_{yt}) + E_{yit} \\ &= \lambda_{T_{yit}} \cdot T_y + \lambda_{I_{yit}} \cdot I_y + \lambda_{O_{yit}} \cdot \beta_{yt(t-1)} \cdot O_{y(t-1)} + \lambda_{O_{yit}} \cdot \beta_{yt(t-2)} \cdot O_{y(t-2)} + \lambda_{O_{yit}} \cdot \gamma_{yt} \cdot O_{x(t-1)} + \lambda_{O_{yit}} \cdot R_{yt} + E_{yit} \end{aligned}$$

In the next step, the covariance between X_t and Y_{it} is rewritten with these regression equations:

$$\begin{aligned} &Cov(X_t, Y_{it}) \\ &= Cov(\lambda_{T_{xt}} \cdot T_x + \beta_{xt(t-1)} \cdot O_{x(t-1)} + \beta_{xt(t-2)} \cdot O_{x(t-2)} + \gamma_{xt} \cdot O_{y(t-1)} + R_{xt}, \\ &\lambda_{T_{yit}} \cdot T_y + \lambda_{I_{yit}} \cdot I_y + \lambda_{O_{yit}} \cdot \beta_{yt(t-1)} \cdot O_{y(t-1)} + \lambda_{O_{yit}} \cdot \beta_{yt(t-2)} \cdot O_{y(t-2)} + \lambda_{O_{yit}} \cdot \gamma_{yt} \cdot O_{x(t-1)} + \lambda_{O_{yit}} \cdot R_{yt} + E_{yit}) \end{aligned}$$

Now this equation is solved:

$$
\begin{aligned}
&Cov(X_t, Y_{it}) \\
&= \lambda_{T_{xt}} \cdot \lambda_{T_{yit}} \cdot Cov(T_x, T_y) + \lambda_{T_{xt}} \cdot \lambda_{I_{yit}} \cdot Cov(T_x, I_y) + \lambda_{T_{xt}} \cdot \lambda_{O_{yit}} \cdot \beta_{yt(t-1)} \cdot Cov(T_x, O_{y(t-1)}) \\
&+ \lambda_{T_{xt}} \cdot \lambda_{O_{yit}} \cdot \beta_{yt(t-2)} \cdot Cov(T_x, O_{y(t-2)}) + \lambda_{T_{xt}} \cdot \lambda_{O_{yit}} \cdot \gamma_{yt} \cdot Cov(T_x, O_{x(t-1)}) + \lambda_{T_{xt}} \cdot \lambda_{O_{yit}} \cdot Cov(T_x, R_{yt}) \\
&+ \lambda_{T_{xt}} \cdot Cov(T_x, E_{yit}) + \beta_{xt(t-1)} \cdot \lambda_{T_{yit}} \cdot Cov(O_{x(t-1)}, T_y) + \beta_{xt(t-1)} \cdot \lambda_{I_{yit}} \cdot Cov(O_{x(t-1)}, I_y) \\
&+ \beta_{xt(t-1)} \cdot \lambda_{O_{yit}} \cdot \beta_{yt(t-1)} \cdot Cov(O_{x(t-1)}, O_{y(t-1)}) + \beta_{xt(t-1)} \cdot \lambda_{O_{yit}} \cdot \beta_{yt(t-2)} \cdot Cov(O_{x(t-1)}, O_{y(t-2)}) \\
&+ \beta_{xt(t-1)} \cdot \lambda_{O_{yit}} \cdot \gamma_{yt} \cdot Cov(O_{x(t-1)}, O_{x(t-1)}) + \beta_{xt(t-1)} \cdot \lambda_{O_{yit}} \cdot Cov(O_{x(t-1)}, R_{yt}) + \beta_{xt(t-1)} \cdot Cov(O_{x(t-1)}, E_{yit}) \\
&+ \beta_{xt(t-2)} \cdot \lambda_{T_{yit}} \cdot Cov(O_{x(t-2)}, T_y) + \beta_{xt(t-2)} \cdot \lambda_{I_{yit}} \cdot Cov(O_{x(t-2)}, I_y) + \beta_{xt(t-2)} \cdot \lambda_{O_{yit}} \cdot \beta_{yt(t-1)} \cdot Cov(O_{x(t-2)}, O_{y(t-1)}) \\
&+ \beta_{xt(t-2)} \cdot \lambda_{O_{yit}} \cdot \beta_{yt(t-2)} \cdot Cov(O_{x(t-2)}, O_{y(t-2)}) + \beta_{xt(t-2)} \cdot \lambda_{O_{yit}} \cdot \gamma_{yt} \cdot Cov(O_{x(t-2)}, O_{x(t-1)}) \\
&+ \beta_{xt(t-2)} \cdot \lambda_{O_{yit}} \cdot Cov(O_{x(t-2)}, R_{yt}) + \beta_{xt(t-2)} \cdot Cov(O_{x(t-2)}, E_{yit}) \\
&+ \gamma_{xt} \cdot \lambda_{T_{yit}} \cdot Cov(O_{y(t-1)}, T_y) + \gamma_{xt} \cdot \lambda_{I_{yit}} \cdot Cov(O_{y(t-1)}, I_y) + \gamma_{xt} \cdot \lambda_{O_{yit}} \cdot \beta_{yt(t-1)} \cdot Cov(O_{y(t-1)}, O_{y(t-1)}) \\
&+ \gamma_{xt} \cdot \lambda_{O_{yit}} \cdot \beta_{yt(t-2)} \cdot Cov(O_{y(t-1)}, O_{y(t-2)}) + \gamma_{xt} \cdot \lambda_{O_{yit}} \cdot \gamma_{yt} \cdot Cov(O_{y(t-1)}, O_{x(t-1)}) + \gamma_{xt} \cdot \lambda_{O_{yit}} \cdot Cov(O_{y(t-1)}, R_{yt}) \\
&+ \gamma_{xt} \cdot Cov(O_{y(t-1)}, E_{yit}) \\
&+ \lambda_{T_{yit}} \cdot Cov(R_{xt}, T_y) + \lambda_{I_{yit}} \cdot Cov(R_{xt}, I_y) + \lambda_{O_{yit}} \cdot \beta_{yt(t-1)} \cdot Cov(R_{xt}, O_{y(t-1)}) + \lambda_{O_{yit}} \cdot \beta_{yt(t-2)} \cdot Cov(R_{xt}, O_{y(t-2)}) \\
&+ \lambda_{O_{yit}} \cdot \gamma_{yt} \cdot Cov(R_{xt}, O_{x(t-1)}) + \lambda_{O_{yit}} \cdot Cov(R_{xt}, R_{yt}) + Cov(R_{xt}, E_{yit})
\end{aligned}
$$

The trait factors are uncorrelated with the indicator-specific factor, the occasion-specific factors, and the residual factors. In addition, the occasion-specific factors are uncorrelated with the indicator-specific factor and the residuals factors, and the indicator-specific factor is uncorrelated with the residual factors. Therefore, the equation reduces to

$$
\begin{aligned}
&Cov(X_t, Y_{it}) \\
&= \lambda_{T_{xt}} \cdot \lambda_{T_{yit}} \cdot Cov(T_x, T_y) \\
&+ \beta_{xt(t-1)} \cdot \lambda_{O_{yit}} \cdot \gamma_{yt} \cdot Var(O_{x(t-1)}) \\
&+ \gamma_{xt} \cdot \lambda_{O_{yit}} \cdot \beta_{yt(t-1)} \cdot Var(O_{y(t-1)}) \\
&+ \lambda_{O_{yit}} \cdot Cov(R_{xt}, R_{yt})
\end{aligned}
$$

Dividing this equation by the observed covariance gives the covariance components. The proportion of the observed covariance due to stable factors is

$$\frac{\lambda_{T_{xt}} \cdot \lambda_{T_{yit}} \cdot Cov(T_x, T_y)}{Cov(X_t, Y_{it})}.$$

The proportion of the observed covariance due to occasion-specific factors is

$$\frac{\lambda_{O_{yit}} \cdot Cov(R_{xt}, R_{yt})}{Cov(X_t, Y_{it})}$$

The remaining covariance is due to autoregressive and cross-lagged factors:

$$\frac{\beta_{xt(t\text{-}1)} \cdot \lambda_{O_{yit}} \cdot \gamma_{yt} \cdot Var(O_{x(t\text{-}1)}) + \gamma_{xt} \cdot \lambda_{O_{yit}} \cdot \beta_{yt(t\text{-}1)} \cdot Var(O_{y(t\text{-}1)})}{Cov(X_t, Y_{it})}$$

3 Subjective Well-Being and Adaptation to Life Events: A Meta-Analysis

Luhmann, M., Hofmann, W., Eid, M., & Lucas, R. E. (2010). *Subjective well-being and adaptation to life events: A meta-analysis.* Unpublished manuscript.

Abstract

The set-point theory of subjective well-being (SWB) posits that the most life events have only short-term effects on SWB because people adapt quickly. In the present paper, this adaptation hypothesis is examined meta-analytically. Longitudinal data from 247 publications (396 samples, N = 82,893) were integrated to describe reaction and adaptation to five family events (marriage, divorce, bereavement, child birth, health problems of relative) and five work events (unemployment, reemployment, retirement, other occupational transitions, relocation/migration). The findings indicate that people adapt at least partially to most of these events, and most of the adaptation occurs during the first year after the event, with the exception of unemployment where adaptation is much slower. Differential effects were found when different components of SWB were considered: Adaptation was faster for affective well-being than for cognitive well-being. The results are discussed with respect to their theoretical implications, and recommendations for future studies on adaptation are given.

Keywords: subjective well-being, life events, adaptation, longitudinal meta-analysis

Subjective Well-Being and Adaptation to Life Events: A Meta-Analysis

In daily life, most people assume that happiness is subject to change. They strive for specific goals because they believe their attainment will make them happier, and they fear negative life events because they expect to be permanently unhappier than before (e. g., Gilbert, 2006; T. D. Wilson & Gilbert, 2005). However, a widely accepted model of subjective well-being claims that people should inevitably, quickly, and completely adapt to any life event. This phenomenon has been described in theories such as adaptation-level theory (Brickman & Campbell, 1971; Helson, 1948, 1964), dynamic equilibrium theory (Headey & Wearing, 1989, 1992), and set-point theory (Diener, Lucas, & Scollon, 2006; Lykken & Tellegen, 1996).

The fundamental premise of these accounts is that the habitual level of subjective well-being (SWB) is highly stable. Changes in life circumstances can cause short-term increases or decreases of SWB, but within a matter of months (Suh, Diener, & Fujita, 1996), it returns to its initial level (also called adaptation level, baseline, or set point). Indirect support for this assumption comes from three different types of studies: (a) In cross-sectional studies, the correlations between SWB and external life circumstances (e. g., income, marital status, age) are typically small to moderate, whereas the correlations between SWB and personality characteristics such as neuroticism and extraversion are usually substantially higher (for a review, see Diener, Suh, Lucas, & H. L. Smith, 1999). (b) Longitudinal studies repeatedly find that individual differences in SWB are highly stable over time (Eid & Diener, 2004), even if very long time spans are examined (Fujita & Diener, 2005; Lucas & Donnellan, 2007). (c) Twin studies suggest that SWB has a heritable component (e. g., Lykken & Tellegen, 1996; Riemann, Angleitner, Borkenau, & Eid, 1998; Stubbe, Posthuma, Boomsma, & De Geus, 2005; Weiss, Bates, & Luciano, 2008). All of these studies are in line with the adaptation hypothesis, and often been interpreted this way (e. g., Diener et al., 1999).

However, a stricter test of the adaptation hypothesis requires that changes in life circumstances be assessed directly. One way to do this is to examine SWB in the context of major life events, including marriage, bereavement, or unemployment. In one of the first studies in this line of research, the average SWB levels of recent lottery winners and paraplegics were compared to the average SWB level of a control group (Brickman, Coates, & Janoff-Bulman, 1978). The authors found the mean-level differences to be smaller than expected and concluded that both lottery winners and paraplegics adapted completely to these major life events. Most studies on life events and SWB that were conducted in the following decades came to the same conclusion (Frederick & Loewenstein, 1999).

In recent years, however, the adaptation hypothesis has been challenged empirically (e. g., Lucas, 2005, 2007a; Lucas, Clark, Georgellis, & Diener, 2003, 2004) and theoretically (Diener et al., 2006; Headey,

2006, 2010). In a series of studies using large-scale panel data such as the German Socio-Economic Panel (SOEP; Wagner, Frick, & Schupp, 2007) and the British Household Panel Study (BHPS; Taylor, Brice, Buck, & Prentice-Lane, 2009), Lucas and his colleagues demonstrated that the negative effects of major life events such as the onset of disability and widowhood can persist over several years (for a review, see Lucas, 2007b). The effects were perhaps most striking for unemployment. After the onset of unemployment, the mean levels of SWB were significantly below baseline, even if people became reemployed (Lucas et al., 2004). Repeated unemployment spells accelerate this effect (Luhmann & Eid, 2009). The SOEP has also been used to offer indirect evidence against the classic adaptation hypothesis: In several studies, it was shown that although most persons have stable habitual levels of SWB over time, there is a substantial proportion of individuals who report large and permanent changes (Fujita & Diener, 2005; Headey, 2008).

Besides these recent studies using panel data, the role of adaptation to life events has been an important topic of many other studies for a long time, in psychology as well as in other disciplines. However, a comprehensive meta-analytic study evaluating these previous studies with respect to the adaptation hypothesis is still missing. The present paper fills this important gap. For this purpose, we examined major family- and work-related life events and tested whether and how SWB changes in the context of these events. Our meta-analysis was conducted to overcome three shortcomings: First, for some of the previous literature, popular (mis)interpretations have prevailed although the empirical findings were often less clear. The classic example is the lottery study by Brickman et al. (1978) described above: Although the standardized mean difference between the paraplegic and the control group was $d = 0.75$ and therefore quite strong (as shown by Diener et al., 2006), this study has very often been cited as support for the validity of the adaptation hypothesis (e. g., Diener et al., 1999; Filipp & Klauer, 1991). Second, a large part of the typically-cited evidence stems from cross-sectional studies. As we will discuss in more detail below, cross-sectional studies do not control for pre-existing differences between people and are therefore hard to interpret with respect to adaptation. Therefore, only longitudinal studies will be considered. Finally, studies published in non-psychological journals (e. g., medical journals) are rarely considered in discussions of the adaptation hypothesis. The present meta-analysis will integrate studies on SWB and life events from various disciplines.

In meta-analyses, it is particularly important to clearly define all constructs. In the remainder of the introduction, we will offer definitions for subjective well-being, life events, and adaptation, followed by an overview of the meta-analysis.

3.1 Subjective Well-Being

Subjective well-being relates to how people feel and think about their lives (Diener, 1984). It is a broad concept that can be divided into two components: Affective well-being (AWB) refers to the presence of pleasant affect (e. g., feelings of happiness) and the absence of unpleasant affect (e. g., depressed mood). Cognitive well-being (CWB) refers to cognitive evaluation of life overall (i. e., global life satisfaction) as well as of more domains (e. g., job satisfaction or marital satisfaction). AWB and CWB differ in their associations with other variables and can therefore be considered as conceptually distinct (Lucas, Diener, & Suh, 1996; Schimmack, Schupp, & Wagner, 2008).

Subjective well-being needs to be distinguished from other related psychological constructs. *Happiness* is used to describe a specific pleasant state ("happy") or as a synonym for SWB (as we do in the present paper). It is therefore important to determine its specific meaning in every publication where this term is used. *Psychological well-being* (Ryff, 1989), also known as eudaimonic well-being (Ryan & Deci, 2001), is a broader concept of well-being that includes facets such as self-acceptance, purpose in life, and personal growth. It has been suggested that the classic hedonic treadmill idea applies only to SWB, but not to psychological well-being, which is thought by some to be more sustainable (Waterman, 2007). The present meta-analysis will therefore be limited to SWB sensu Diener (1984). *Mental health* is used in very diverse ways (Vaillant, 2003). In medical contexts, this term typically describes the absence of mental disorders. Subjective well-being is a much broader concept because negative *and* positive states are considered, ranging all the way "from misery to elation" (Diener et al., 1999, p. 277). A specific mental disorder that needs to be distinguished from SWB is *major depression disorder*, a clinical syndrome that incorporates low affective well-being, but also somatic symptoms such as low appetite or sleeping difficulties. Subjective well-being, by contrast, is a purely psychological concept. Somatic states can, of course, be associated with specific states of SWB, but they do not define SWB.

As we will specify below, we included these terms in our literature search, but we limited our analyses to those studies that assessed SWB as defined by Diener (1984).

3.2 Life Events

Life events have been examined from two major perspectives (Filipp & Aymanns, 2009): a stress perspective and a developmental perspective. From the stress perspective, life events are viewed as specific types of stressors (e. g., Park, 2010; Segerstrom & Miller, 2004). Stressful life events are all events that significantly disturb the daily routine (Turner & Wheaton, 1997). This definition explicitly includes desirable events such as marriage or vacation (Holmes & Rahe, 1967). By contrast, minor stressors such

as daily hassles and uplifts (Kanner, Coyne, Schaefer, & Lazarus, 1981) are distinct from stressful life events.

From the developmental perspective, life events are viewed as specific transitions. Transitions are defined as a "discontinuity in a person's life space of which he is aware and which requires new behavioural responses" (Hopson & Adams, 1976, p. 24). The duration and course of the transition is not further specified in this definition, meaning that transitions can be slow and continuous (e. g., puberty) as well as fast and discrete (e. g., transition from middle school to high school).

Both the stress perspective and the developmental perspective offer rather broad definitions. For the purpose of this meta-analysis, we developed a narrower definition of life events that considers elements from both the stress perspective and the developmental perspective. According to this working definition, life events are time-discrete transitions that mark the beginning or the end of a specific status. A status is a nominal variable with at least two values. For instance, marital status can be single, married, separated, divorced, or widowed. Occupational status can be employed, unemployed, studying, and so on. The transition from one status to another is a specific life event, for instance, marriage (from single to married), divorce (from married to divorced), job loss (from employed to unemployed) or reemployment (from unemployed to employed). This narrow definition excludes minor life events such as daily hassles (which do not imply a status change), and slow transitions such as puberty (which are not discrete). Also, non-events (e. g., not finding a marital partner, involuntary childlessness) are not examined within this meta-analysis.

3.3 Adaptation

The term adaptation appears in different contexts in psychology and is often used interchangeably with related concepts such as adjustment and habituation. In its broadest sense, adaptation describes either a status or a process.

In the *status perspective*, adaptation (or adjustment) is defined as a current state: Someone is well adapted (well adjusted) when his or her individual level of SWB exceeds a specific criterion. This criterion can be absolute (e. g., above neutral on a life satisfaction scale; below a clinically relevant score on a depression scale) or relative with respect to a specific comparison group (e. g., the general population, a control group, or a comparison group not having experienced a specific event). Adaptation to life events within this perspective can be examined by means of a single assessment. Numerous studies used this perspective, from Brickman et al. (1978) to very recent publications (e. g., Srivastava, Tamir, McGonigal, John, & Gross, 2009).

The status perspective offers an economic approach to examining adaptation to life events, but it suffers from a number of serious shortcomings. The first is related to a general problem of research on life events: Major life events cannot be manipulated experimentally, so all empirical studies on life events necessarily suffer from reduced internal validity. In cross-sectional studies comparing different groups, it is impossible to know whether the observed differences are due to the occurrence or non-occurrence of a specific life event, yet many authors have drawn this very inference. However, a cumulating body of research suggests that variables such as SWB (Luhmann, Eid, Lucas, & Diener, 2010) or personality (Headey, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007) predispose individuals to experience specific life events. In short, potential pre-existing differences between individuals experiencing specific events and individuals not experiencing these events are completely neglected within the status perspective on adaptation.

A second limitation concerns the focus on interindividual differences. A person is considered to be well adjusted when her SWB score is on the positive side of an empirical or normative cutoff. However, neither an above-neutral SWB score nor the absence of psychopathology is a sufficient indicator of adaptation (Bonanno, 2004; Diener et al., 2006) because these indicators do not reflect change processes that occurred within individuals. According to the status perspective, someone with a life satisfaction score of 20 is defined as better adapted than someone with a life satisfaction score of 18, even if his or her score before the event was 25 and the one of the other person was 16. This example is not totally arbitrary: It is well known that SWB is highly stable over time (Eid & Diener, 2004; Lucas & Donnellan, 2007); therefore we would expect that very happy persons are still happier after major negative life events than very unhappy persons.

Whereas the status perspective focuses on differences between individuals, the *process perspective* explicitly predicts the trajectory of SWB over time *within* individuals. The adaptation process is initiated by an external stimulus (e. g., a major life event) that causes a physiological or psychological response (e. g., decreased SWB). Over time, the responsiveness diminishes. Adaptation is complete when the post-event response has returned to its pre-event baseline level. This broad concept can be applied to physiological (Helson, 1948, 1964) as well as to psychological phenomena (Frederick & Loewenstein, 1999; T. D. Wilson & Gilbert, 2008). For negative life events, adaptation is comparable to a recovery trajectory in which "normal functioning temporarily gives way to threshold or subthreshold psychopathology […], usually for a period of at least several months, and then gradually returns to pre-event levels" (Bonanno, 2004, p. 20). Theoretically, it is possible that the responsiveness does not diminish but, on the contrary, intensifies over time. This process is called sensitization (Frederick & Loewenstein, 1999).

In the present meta-analysis, we define adaptation according to the process perspective: Adaptation describes "processes that attenuate the long-term emotional or hedonic impact of favorable and unfa-

vorable circumstances" (Frederick & Loewenstein, 1999, p. 302). These processes can only be examined in studies with multiple measurements; therefore, only longitudinal studies will be considered in the present meta-analysis. We distinguished between two types of longitudinal designs: prospective and post-hoc designs. In *prospective* designs, the first measurement occasion takes place before the event, which means that the pre-event level and post-event level of SWB can be compared. If multiple measurements after the event are available, it is possible to estimate the initial hedonic reaction to the event as well as the rate of adaptation over time. In *post-hoc* studies, the first measurement occasion takes place some time after the event. These studies are useful to assess changes in SWB that occurred after the initial hedonic reaction to the event has passed. However, it is not possible to estimate the initial reaction itself, nor is it possible to examine whether SWB returns to its pre-event level. In sum, both prospective and post-hoc studies can be used to examine adaptation, and taken together, they can yield a very detailed picture of the specific processes.

3.3.1 Differential Effects of Life Events on SWB

The magnitude and duration of the hedonic reaction to life events depends on a number of factors. One of them is the type of the event. In one of the first publications on differential effects of life events, Holmes and Rahe (1967) proposed a ranking of life events based on how much adjustment they required. In their ranking, the top three events requiring most adjustment were widowhood, divorce, and marital separation. Subsequent authors described the differential effects of life events along more general dimensions. For instance, the impact of negative events on SWB seems to be stronger and more persistent than the impact of positive events (e. g., Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Fredrickson & Losada, 2005; Larsen & Prizmic, 2008).

Another factor that may moderate adaptation effects is the specific component of SWB that is considered. AWB and CWB are distinct components of SWB (Lucas et al., 1996) that differ in their stability and variability over time (Eid & Diener, 2004). It is therefore possible that life events do not affect AWB and CWB to the same degree. One reason is that in CWB measures, people are more explicitly asked to evaluate their life than in AWB measures. Recent life events are likely to influence the judgmental processes that precede this evaluation. Another reason is the adaptive function of affective well-being: Negative emotions are assumed to serve as warnings that something is wrong. Their main function is to trigger specific action tendencies (Frijda, 1999). To work properly, this warning system must be sensitive to new stimuli which requires that the effect of older stimuli fades over time. On the contrary, CWB may be part of a more long-term oriented cognitive system whose primary function may be to "extract a lesson" for similar future occasions (T. D. Wilson & Gilbert, 2008). Thus, adaptation of AWB might be faster than adaptation of CWB (see also Fujita & Diener, 2005). Preliminary evidence for this hypothesis is offered by a study showing that unemployed are significantly less satisfied with

their lives than employed individuals, but they do not differ in their daily affective well-being (Knabe, Rätzel, Schöb, & Weimann, 2009).

3.3.2 Anticipatory Effects

Most major life events are to some extent controllable and, therefore, predictable. For instance, marriage, divorce, or the transition from college into work can be (at least under normal circumstances) anticipated sometime beforehand. This anticipation might cause a specific hedonic reaction even before the event occurred. For instance, if the spouse is terminally ill, the hedonic reaction to bereavement starts long before the spouse actually dies. These so-called anticipatory or lead effects can be observed months or even several years before the occurrence of the event (Clark, Diener, Georgellis, & Lucas, 2008) and need to be taken into account in the interpretation of the present meta-analytic findings.

3.4 Overview of the Present Meta-Analysis

The primary goal of the present meta-analysis is to examine whether the empirical evidence on life events and SWB is consistent with the adaptation hypothesis. The number of life events that have been studied is enormous. Therefore, we focused on specific events from two important life domains: family and work (including events such as marriage, divorce, bereavement, child birth, unemployment, reemployment, and retirement). Further selections were made based on the number of studies we found on specific events: If the number of studies on an event was very small (5 or less studies), we excluded this event category from the meta-analysis. As different life events can have differential effects on SWB (see above), all life events were examined separately. For each event, the analyses were guided by the following research questions:

1. What is the initial hedonic impact of the event on SWB?
2. What is the average rate and shape of adaptation over time?
3. Do the initial hedonic impact and the rate of adaptation differ for AWB and CWB?

As a secondary goal, we examined whether the effect sizes varied according to specific characteristics of the samples. Based on previous work, it can be expected that specific life events do not affect men and women similarly (e. g., Luhmann & Eid, 2009). Gender differences were not the main focus of this meta-analysis; therefore, we did not search for studies that compared men and women directly. However, we were able to examine whether the percentage of males in a sample accounted for variance in the effect sizes. As a second demographic moderator, we examined linear and quadratic effects of the mean age of the sample. Some life events are more frequent in some age groups (e. g., widowhood is

typically experienced in old age), and it can be speculated that the hedonic impact of these events is stronger if the mean age of the sample deviates from the typical or normative age.

Apart from these demographic variables, we were also interested in the effects of methodological characteristics of the samples. In the present meta-analysis, only longitudinal studies were considered. Longitudinal studies typically encounter problems with drop-outs which can be a serious threat to the internal validity of these studies (Frederick & Loewenstein, 1999). In this context, we analyzed the attrition rate and the existence of systematic drop-out as moderators. Finally, we coded whether the data were collected to study a specific life event. We assume that samples that were collected in the context of a specific life event are more likely to be influenced by demand effects: If the participants know that the interviewers are interested in them because of a specific life experience, they are more likely to focus on this experience when answering the questions than participants who took part in broader studies.

In the following sections, we will give an overview of the literature search, the coding process and the meta-analytic computations. The results will be presented separately for each life event. The result section concludes with a sensitivity analysis where the impact of important methodological decisions on the results will be reported.

3.5 Method

3.5.1 Literature Search

Life events are not only investigated in psychology, but also in related disciplines such as medicine, sociology, and economics. Therefore, we conducted a broad literature search in data bases from various disciplines: *Academic Search Premier*, *ERIC*, *Medline*, *Psychology and Behavioral Sciences Collection*, *PsycINFO*, and *SocINDEX*. The literature search was conducted in spring 2008 and updated in winter 2009. We used broad search terms that sometimes, but not always, captured studies on SWB according to Diener's (1984) conceptualization. For SWB, we used the following keywords: *well-being*, *life satisfaction, positive affect*, negative affect*, happiness, quality of life, depression*. An asterisk at the end of the keyword signals that any terms that begin with this keyword are included. Although we did not look for studies on clinical depression, we included depression as a keyword in order to find studies that used depression measures to assess depressed mood. To restrict the literature search to longitudinal studies, the keywords were combined with the additional terms *longitudinal, long-term, adjustment, follow-up,* and *adaptation*. The initial literature search was not restricted to specific life events; however, some studies were excluded at a later time because the event was too specific (see below). Based on the title and abstract, 2,330 publications were positively evaluated. Of these, 2,150 publications (92.5 %) could be retrieved in

electronic form, in print, or directly from the author. In addition to searching data bases, we sent requests to the Society for Personality and Social Psychology (SPSP) listserv. Through this procedure, we retrieved 7 additional manuscripts, resulting in a total of 2,157 publications.

3.5.2 Study Eligibility

Study eligibility was determined in a two-step procedure (Figure 3.1). In the first step, studies were coded for study-related characteristics only and inclusion criteria 1 through 6 were applied. In the second step, studies were fully coded (as described in the next section) and criteria 7 and 8 were applied. Our inclusion criteria were:

1. *Quantitative data.* Publications that were purely theoretical or only reported qualitative data were excluded.

2. *Longitudinal studies.* Publications were excluded if one of the following criteria applied: (a) cross-sectional studies with only one time point, (b) only retrospective measurement of SWB, (c) multiple time points but no repeated assessment of SWB, (d) measures (e. g., number of items in the scale) were modified from one time point to another.

3. *A single family- or work-related life event must have been reported.* We excluded all publications that did not report any life events. Moreover, studies reporting only aggregate measures of life events (i. e., the total number of life events experienced in a certain time frame) and studies reporting medical or very specific life events (e.g. abuse discovery) were also excluded.

4. *Appropriate definition and measurement of SWB.* We only included studies that assessed SWB as defined by Diener (1984). Related variables such as psychological well-being (Ryff, 1989) were excluded. Moreover, we excluded studies focusing on specific emotions such as anxiety or anger. Studies assessing depressive affect or depression were only included if they were assessed with a scale that consists mostly of non-somatic items. The most frequently used scale in our meta-analysis was the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) which mostly taps into affective symptoms.

5. *Information about the timing of the event and the measurement occasions must be available.* Studies that allowed only a very imprecise estimate of when the event happened where excluded. For instance, several studies using data from the National Survey of Families and Households (NSFH; Sweet, Bumpass, & Call, 1988) were excluded because the event occurred anywhere within a time frame of 5 to 7 years.

6. *No studies evaluating professional interventions of any kind.* Interventions might affect the regular adaptation processes. An evaluation of different intervention methods in the context of adaptation is clearly an issue for a separate meta-analysis.

7. *Unduplicated data.* After coding, publications were checked for duplicate datasets because findings from longitudinal datasets are frequently reported in multiple publications. For each event, only one publication per dataset was included. Priority was given to articles reporting (a) more time points, (b) larger sample sizes, and (c) more descriptive statistics.

8. *Statistical sufficiency.* Only studies with sufficient descriptive statistics could be considered. To calculate effect sizes, means and standard deviations for each time point were required. In addition, the autocorrelation of the outcome variable (i. e., the correlation between SWB at Time 1 and SWB at Time 2), a t-statistic, or the standard deviation of the pre-post difference variable is necessary in order to estimate the sampling variance for the effect sizes (see below). If the statistics reported in the study were insufficient, the authors were contacted via e-mail. In total, the authors of 210 publications published after 1989 (47.2 % of all coded publications) were contacted. Of these, 170 (81.0 %) responded and 86 (41.0 %) provided the missing information. Studies were excluded if means or standard deviations were missing. Missing correlation coefficients were replaced by plausible values (see below); therefore, publications not reporting this information did not have to be excluded.

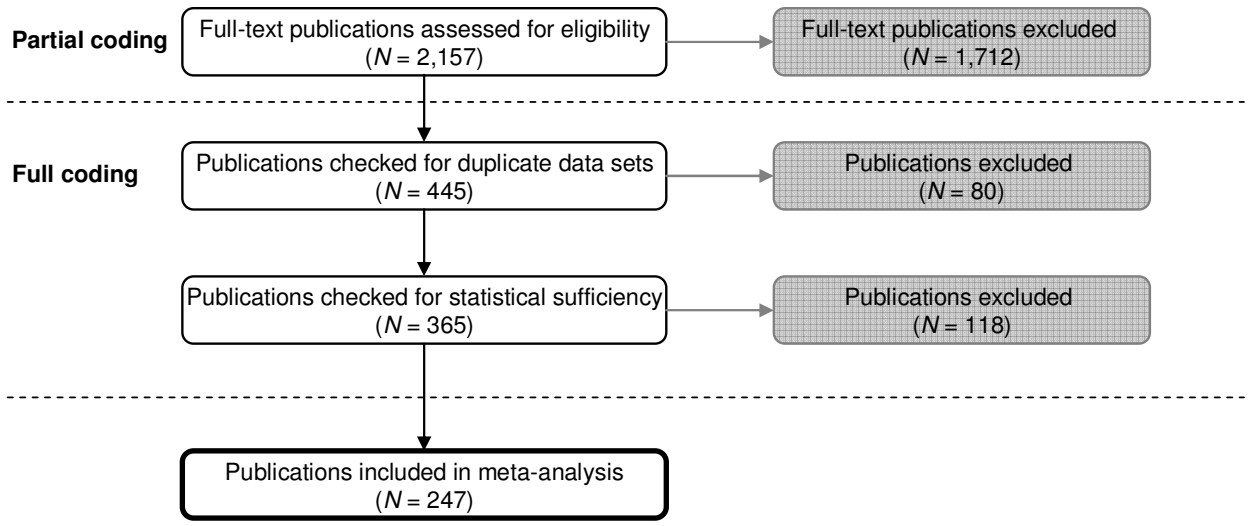


Figure 3.1. Flowchart describing the study selection procedure.

All publications that were excluded based on criteria 7 and 8 were fully coded. It was therefore possible to examine whether publications that were excluded because of duplicated data, publications that were excluded for statistical reasons, and publications that were retained in the meta-analysis differed significantly in any characteristics. Publications that were excluded because of insufficient statistics were significantly older, $F(2,485) = 21.20$, $p < .001$. Duplicate datasets were most frequently observed in publications on marriage (25 out of 56 publications, corresponding to an exclusion rate of 44.6 %) and bereavement (23 out of 87 publications, corresponding to an exclusion rate of 26.4 %). By contrast, only few publications on child birth were excluded because of duplicate data (11 out of 144 publications, corresponding to an exclusion rate of 7.6 %). After application of criteria 1 to 8, 247 publications were included in the meta-analysis.[5]

3.5.3 Coding

Coding was done by the first author and a student assistant. The codes were recorded on a standardized coding sheet which was accompanied by a detailed coding manual. To evaluate the coding process and to estimate interrater agreement, 45 studies were double-coded. For categorical variables (e. g., type of event), interrater agreement was estimated using coefficient Kappa κ (Cohen, 1960). Interrater agreement is acceptable for $\kappa > .60$ and good for $\kappa > .80$ (Nussbeck, 2006). For continuous variables (e. g., means, standard deviations), an intraclass correlation coefficient (ICC) that takes the agreement between the judges into account was computed (Shrout & Fleiss, 1979). All analyses on interrater agreement were within the statistical software R version 2.10.0 (R Development Core Team, 2009) using the respective functions of the package *irr* (Gamer, Lemon, & Fellows, 2009).

An overview of the coded characteristics is given in Table 3.1. Different hierarchical levels of these characteristics can be distinguished: On the publication level, we coded the publication year as well as country of affiliation and discipline of the first author. On the event level, different types of events were distinguished. Initially, all kinds of family- and work-related events were coded. In Table 3.1, only the included events are shown.

On the sample level, different characteristics of the specific samples were coded: type of sample (e. g., nationally representative sample, ad-hoc adult sample, children and adolescents), initial purpose of data collection (was this sample drawn to investigate this specific life event or not), percentage of males, age distribution (mean, standard deviation, minimum, maximum) and modal ethnicity (e. g., mostly White/Caucasian). In addition, the number of participants taking part in all waves of the study and the

[5] A detailed list of all excluded studies and the reason for exclusion can be obtained from the first author.

estimated attrition rate were coded if possible. We also coded whether evidence concerning potential systematic drop-out was reported.

For some samples, multiple outcome measures were reported. On the variable level, information about the type and measurement of the outcome variable were coded: affective versus cognitive well-being, description of the specific construct (e. g., global life satisfaction or domain-specific satisfaction), positive versus negative well-being, the method of data collection (e. g., self-report, observation), which scale was used to measure the construct (e. g., Satisfaction With Life Scale; Diener, Emmons, Larsen, & Griffin, 1985), source and reported value of reliability estimate, number of items of the scale, and time frame (e. g., global SWB, SWB during the past week). In addition, information about the study design was also coded on the variable level because the designs (e. g., the number of time points) could vary within samples and between different outcome variables. Specifically, we coded the number of time points, the year of the first data collection, and the type of design (prospective or post-hoc; see below).

Characteristics that could change from one time point to the next were coded on the time point level: time lag between the specific time point and the event in months, sample size at this time point (if possible, this information was retrieved from tables reporting descriptive statistics, otherwise the numbers in the sample description were used), and descriptive statistics (mean, standard deviation, correlation with the first measurement occasion, standard deviation of differences score, *t*-value for the mean difference between two time points). If the time lag between the time point and the event varied within the sample, the average time lag was coded.

Interrater agreement was acceptable for most characteristics except for the data source ($\kappa = 0.11$). This discrepancy is caused by the fact that in many studies, it is not clearly reported whether the participants were interviewed or whether they completed the questionnaires themselves. Due to the low interrater agreement, the data source was not included in any of the following analyses. For the other characteristics, discrepancies between raters were resolved through discussion.

Table 3.1. Summary of coded characteristics, percentage of missing data, and interrater agreement.

Level	Variable	Coding options	Missing %	IA
Publication	Year of publication	metric	0.00 %	1.00
Publication	Origin of first author	1 = USA 2 = Canada 3 = Germany 4 = Great Britain 5 = Netherlands 6 = Scandinavia 7 = Australia 8 = Other Western European countries 9 = Eastern Europe incl. Russia 99 = Other	1.63 %	1.00
Publication	Discipline of first author	1 = Psychology 2 = Medicine / Psychiatry 3 = Sociology 4 = Economics 5 = Education 99 = Other	8.54 %	0.94
Event	Type of event	1 = Marriage 2 = Divorce 3 = Bereavement 4 = Child birth 5 = Health problems in relative 6 = Unemployment 7 = Reemployment 8 = Retirement 9 = Other occupational transitions 10 = Migration/relocation	0.00 %	0.93
Sample	Type of sample	1 = representative panel 2 = ad-hoc adult sample 3 = students 4 = children and adolescents up to 18 years 99 = other type of sample	0.00 %	0.72
Sample	Number of persons who participated at all time points	metric	19.04 %	0.98
Sample	Attrition rate	metric (range: 0 to 1)	44.92 %	0.55
Sample	Evidence for systematic drop-out	0 = no 1 = yes	71.07 %	a
Sample	Data collected for this event	0 = no 1 = yes	0.00 %	a
Sample	Proportion of men in sample	metric (range: 0 to 1)	11.17 %	0.95
Sample	Age of sample: mean	metric	20.30 %	1.00
Sample	Age of sample: *SD*	metric	44.67 %	1.00
Sample	Age of sample: minimum	metric	56.85 %	1.00
Sample	Age of sample: maximum	metric	58.38 %	1.00

Level	Variable	Coding options	Missing %	IA
Sample	Predominant ethnicity of the sample	1 = White/Caucasian 2 = Black 3 = Hispanic 4 = Native American 5 = Asian 6 = Mixed 99 = Other	53.81 %	0.73
Variable	Outcome variable - general	1 = cognitive well-being 2 = affective well-being	0.40 %	0.77
Variable	Outcome variable - detailed	1 = life satisfaction 2 = domain satisfaction 3 = positive affect 4 = negative affect 5 = affect balance	1.39 %	1.00
Variable	Positive vs. negative well-being	-1 = high values indicate low well-being 1 = high values indicate high well-being	0.00 %	a
Variable	Data source	1 = self-report questionnaire 2 = self-report interview 3 = self-report via ambulatory assessment 4 = self-report day reconstruction method 5 = observation 6 = peer report 7 = analysis of written reports 99 = other data source	0.00 %	0.11
Variable	Scale used to measure the variable	categorical	0.00 %	0.95
Variable	Source of reported reliability estimate	0 = not reported 1 = not reported, but reference to another publication 2 = reported and calculated for sample of this study 3 = reported and calculated for sample of another study	1.99 %	0.74
Variable	Reliability estimate	metric	35.86 %	1.00
Variable	Number of items in measure	metric	23.31 %	1.00
Variable	Time frame of measure	1 = general SWB 2 = momentary SWB 3 = SWB with respect to the event 4 = precise time frame (e. g., last month)	56.57 %	0.92
Variable	Number of time points	metric	0.00 %	0.99
Variable	Year of first data collection	metric	58.76 %	1.00
Variable	Prospective vs. post-hoc design	1 = prospective (baseline assessment occurred before the event) 2 = post-hoc (baseline assessment occurred after the event)	0.00 %	1.00
Time point	Time between event and measurement occasion in months	metric	0.00 %	0.98
Time point	Sample size	metric	0.00 %	1.00
Time point	Descriptive statistics: mean	metric	0.00 %	1.00

Level	Variable	Coding options	Missing %	IA
Time point	Descriptive statistics: *SD* of raw score	metric	0.40 %	1.00
Time point	Descriptive statistics: Correlation with baseline	metric	44.4 %	1.00
Time point	Descriptive statistics: *SD* of difference score between two time points	metric	93.25 %	1.00
Time point	*t*-value for the mean-level difference between two time points	metric	93.95 %	0.94

Notes. IA = Interrater agreement. Reported values are coefficient Kappa for categorical variables and intraclass correlation coefficients for continuous variables. a = coding was done by the first author only.

3.5.4 Computation of Effect Sizes

Our research questions center on mean-level changes of SWB in the context of life events. Therefore, we calculated pairwise effect sizes that express the mean-level difference between the first time point (baseline) and each subsequent time point. For each sample, we thus calculated $t-1$ effect sizes, t being the total number of time points.

Two alternative standardized effect sizes can be calculated for these pretest-posttest designs: the standardized mean difference and the standardized mean gain (Morris & DeShon, 2002). The numerator of these effect sizes is identical and is calculated by subtracting the posttest score (e. g., Time 2) from the pretest score (e. g., Time 1). However, they differ in the denominator: The standardized mean difference is calculated by dividing the mean difference by the standard deviation of the raw scores (i. e., the standard deviation of the pretest scores, the standard deviation of the posttest scores, or the pooled standard deviation of the pretest and posttest scores), whereas the standardized mean gain is calculated by dividing the mean difference through the standard deviation of the change scores. As the standardized mean gain confounds mean-level differences and individual variation in change (Morris & DeShon, 2002), we chose the standardized mean difference which reflects pure mean-level differences. For instance, an effect size of $d = 0.5$ indicates a mean-level change of half a standard deviation of the baseline scores (for a similar meta-analysis, see Roberts, Walton, & Viechtbauer, 2006).

Positive vs. Negative Well-Being

As the effect sizes are based on the means and standard deviations of the raw scores, it is important to consider whether high scores reflect positive or negative well-being. In the latter case, effect sizes were multiplied with –1. Consequently, positive effect sizes reflect an increase in SWB, and negative effect sizes reflect a decrease in SWB, regardless of the original coding of the variables.

Adjusted Effect Sizes

Effect size estimates can be biased due to sampling error and measurement error. To control for potential sampling bias, the effect sizes were adjusted as proposed by Hedges and Olkin (1985; also Morris, 2000). To control for measurement error, Hunter and Schmidt (1990) proposed a formula that is based on the reported reliability coefficients. In our data base, sample-specific reliability estimates were reported for only 53.3 % of all measures. Therefore, we refrained from adjusting the effect sizes for measurement error. Hence, the present findings may somewhat underestimate true population effect sizes; on the other hand, they yield a clear image of the observed findings in adaptation research.

Sampling Variance

The estimated sampling variance (i. e., the squared standard error) of each effect size is needed for its weighting in meta-analysis. By weighting effect sizes with the inverse of the sampling variance (or by its square root), effect sizes from large samples gain more weight in the calculation of the summary effect than effect sizes from small samples (Lipsey & D. B. Wilson, 2001). We calculated the sampling variance according to the formula reported by Morris and DeShon (2002, Table 2). Among other parameters, the sample size and the retest correlation is required to compute the sampling variance. In longitudinal studies, the sample size often varies between different time points. If unequal sample sizes for two time points were reported, the smaller of these sample sizes was used. The retest correlation is often not reported in longitudinal studies, but it can be estimated if the standard deviation of the difference scores or a *t*-value is reported (see Morris & DeShon, 2002). If neither of these statistics was reported, the authors of the studies were contacted and asked to provide the missing correlation. After this procedure, observed or estimated retest correlations were available for 55.6 % of all effect sizes. For the remaining effect sizes, we followed Borenstein et al. (2009) and replaced all missing coefficients with the median correlation (r = .49). However, as other values might be equally plausible, we conducted additional sensitivity analyses where the missing coefficients were replaced by the first quartile correlation (r = .39) or the third quartile correlation (r = .60).

3.5.5 Meta-Analytic Procedure

Separate Analyses

The sampled studies reported data on ten different categories of life events. These life events were analyzed separately because (1) the events differed in their hedonic valence, including positive events (e. g., marriage), negative events (e. g., unemployment), and neutral events (e. g., transition from university to work life). We expected that some of the events should decrease SWB (quantified by negative effect sizes) whereas others should increase SWB (quantified by positive effect sizes) or have no effects on SWB at all (quantified by zero effect sizes). (2) From previous research, we know that even life events

that presumably are comparable in terms of hedonic valence (e. g., unemployment and divorce) have differential effects on SWB (e. g., Lucas, 2007b; Luhmann & Eid, 2009).

Moreover, prospective and post-hoc designs were analyzed separately. For all studies, the effect sizes were computed in reference to the first time point (see above). However, the interpretation of the effect size depends on the specific study design. For prospective designs, the effect size quantifies the degree to which post-event SWB differs from pre-event SWB. For post-hoc designs, the interpretation of the effect size is quite different: It quantifies the difference of two SWB scores that were both assessed after the event. This effect size tells us something about changes after the event, but it cannot be used to assess whether SWB returns to the pre-event level. Moreover, for a proper interpretation, the time lag between the first time point and the event must be considered.

Publication Bias

Despite our attempts to retrieve unpublished data, most of the data analyzed in this meta-analysis were published in peer-reviewed journals. These kinds of meta-analysis sometimes suffer from the so-called file-drawer problem (Rosenthal, 1979) that describes the fact that it is easier to publish statistically significant results than non-significant results. The effect sizes reported in publications may therefore be overestimated. One straightforward way to assess the degree of publication bias is to estimate the relation between effect size and sample size in regression analyses (Egger, G. D. Smith, Schneider, & Minder, 1997). Sample size and statistical power are positively related which means that small effect sizes are more likely to be detected (and reported) in studies examining large samples. Hence, a significant regression weight shows that sample size and effect size are related which indicates the presence of publication bias. In the present meta-analysis, the magnitude of the effect sizes depends on the time since the event. Therefore, we extended the approach by Egger et al. (1997) by additionally controlling for this variable in the regression analysis.

Meta-Analytic Computations

Two general approaches to meta-analysis can be distinguished (e. g., Borenstein et al., 2009): In fixed-effects models, it is assumed that the true effect size is the same for all studies in the meta-analysis. Variation between the study effect sizes is solely due to sampling error. By contrast, random-effects models assume that there are different true effect sizes. The summary effect is interpreted as the mean of the distribution of true effect sizes. The variation between the true effect sizes is considered in the model as a second source of heterogeneity. It is important to acknowledge that the decision between a fixed-effects and a random-effects model should not be based on heterogeneity tests, but rather on theoretical assumptions (e. g., Borenstein et al., 2009). The studies considered in our meta-analysis vary with respect to measures, design, purpose, and many other variables. Therefore, the random-effects model is more appropriate.

For the moderator analyses, a mixed-effects model was chosen (Borenstein et al., 2009). The analyses were run in Mplus 5 (L. K. Muthén & B. O. Muthén, 2007) using the procedure proposed by Cheung (2008). Many samples provided multiple effect sizes, either because different outcome variables were assessed or because data on more than two time points were reported. We controlled for the statistical dependency of the effect sizes by using the clustering function in Mplus that is available within the COMPLEX procedure. We compared the estimates retrieved with this function to estimates where the statistical dependency was not controlled. The results are reported in the sensitivity analyses below.

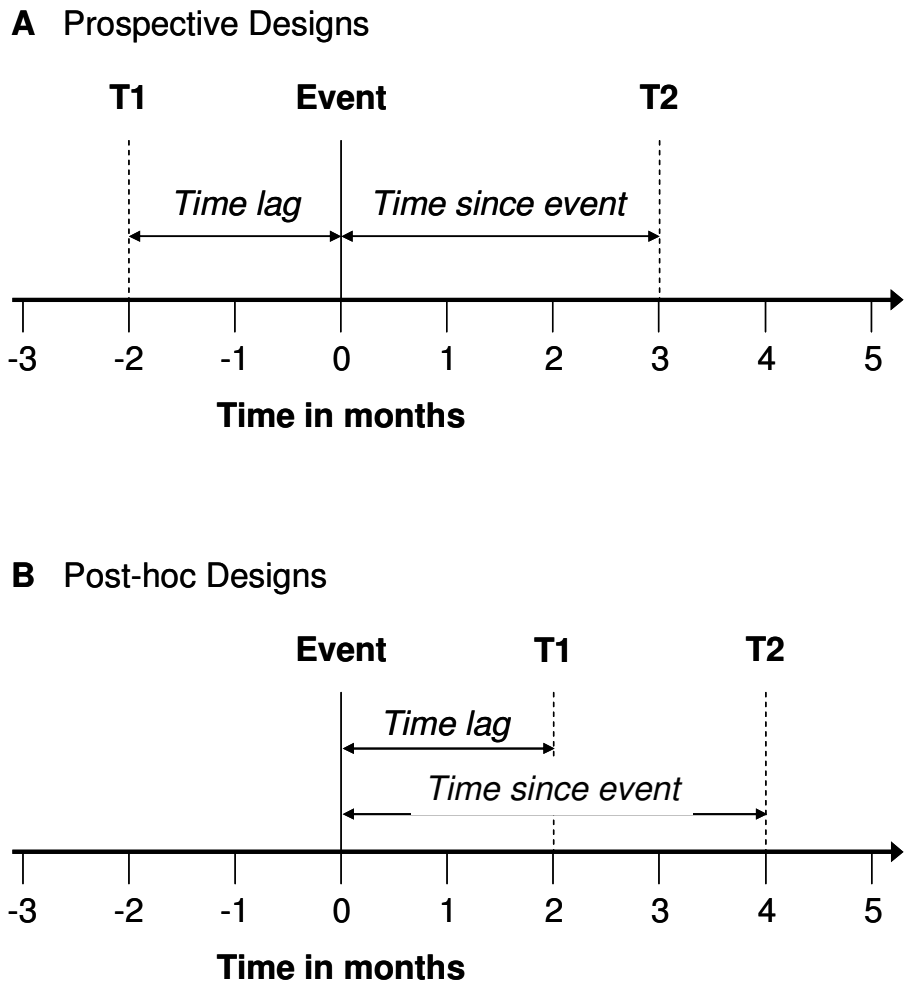


Figure 3.2. Meaning of time lag and time since event in prospective and post-hoc designs.

Analytic Strategy

The effect sizes of prospective and post-hoc designs differ in their interpretation, therefore, these designs were always analyzed separately. The basic strategy was the same for both designs and was guided by the three central research questions (see above).

In Step 1, the initial hedonic reaction and the average rate and shape of adaptation over time were estimated (*Adaptation Model*). In contrast to most other meta-analyses that are mainly interested in a summary effect size, the present meta-analysis focuses on how the effect sizes change as a function of time. Specifically, three different time periods can be distinguished (Figure 3.2): (a) time between event and the first measurement occasion (Time 1), (b) time between event and the second measurement occasion (Time 2), and (c) time between Time 1 and Time 2. As one of these periods can be calculated from the other two, only two time periods need to be considered in the Adaptation Model. For the present meta-analysis, the timing of the event is of central interest. Therefore, the time between the event and Time 1 (*time lag*) and the time between the event and Time 2 (*time since the event*) are included as predictors in the model.

It was expected that if the effect sizes change as a function of time at all, most change should be observed shortly after the event. As the time since the event increases, the effect sizes should asymptote. This trajectory corresponds to a logarithmic curve. Therefore, the logarithm of the time since the event was entered into the Adaptation Model.[6]

As can be seen in Figure 3.2, the interpretation of the *time lag* variable differs between prospective and post-hoc designs: In prospective designs, the sign of the values of this variable is always negative (in this example: -2). The parameter of this predictor is interpreted as the amount of change for the predicted value of the effect size when the *distance* between the baseline and the event is *decreased* by one month (e. g., when the time lag is increased from -2 to -1). To clarify the interpretation of the other parameters in the Adaptation Model, a prototypical course of prospective effect sizes is depicted in Figure 3.3. The time lag between baseline and event is not depicted but held constant at a value of zero. The baseline level is the average level of SWB before the event. The magnitude of the effect sizes reflects the mean-level difference between the baseline level and later time points. The intercept is the expected effect size at the time of the event, that is, the initial hedonic reaction to the event (Research Question 1). A positive intercept indicates a positive initial reaction, and a negative intercept indicates a negative initial reaction. The slope of the time since event is the average rate of logarithmic change per

[6] For each event, we also fitted linear-change models and compared these to the logarithmic-change by examining the information criteria AIC and BIC. In most cases, these criteria were lower for the logarithmic-change models. The parameters for the linear-change model are available from the first author upon request.

month (Research Question 2). If this parameter is non-zero, SWB at later time points differs from SWB immediately after the event. In the example in Figure 3.3, the initial hedonic reaction to the event is positive, as indicated by a positive intercept. The slopes are negative: The effect sizes decrease over time, indicating adaptation. A positive slope (not shown) would indicate sensitization which means that the hedonic reaction to the event becomes stronger over time (Frederick & Loewenstein, 1999). The baseline level is not necessarily identical with the average set-point level (dotted horizontal line), for instance of anticipatory hedonic reactions. The average set-point level is unknown in almost all studies in the present meta-analysis, therefore it is not possible to test whether adaptation is complete (as indicated by a return to the set point).

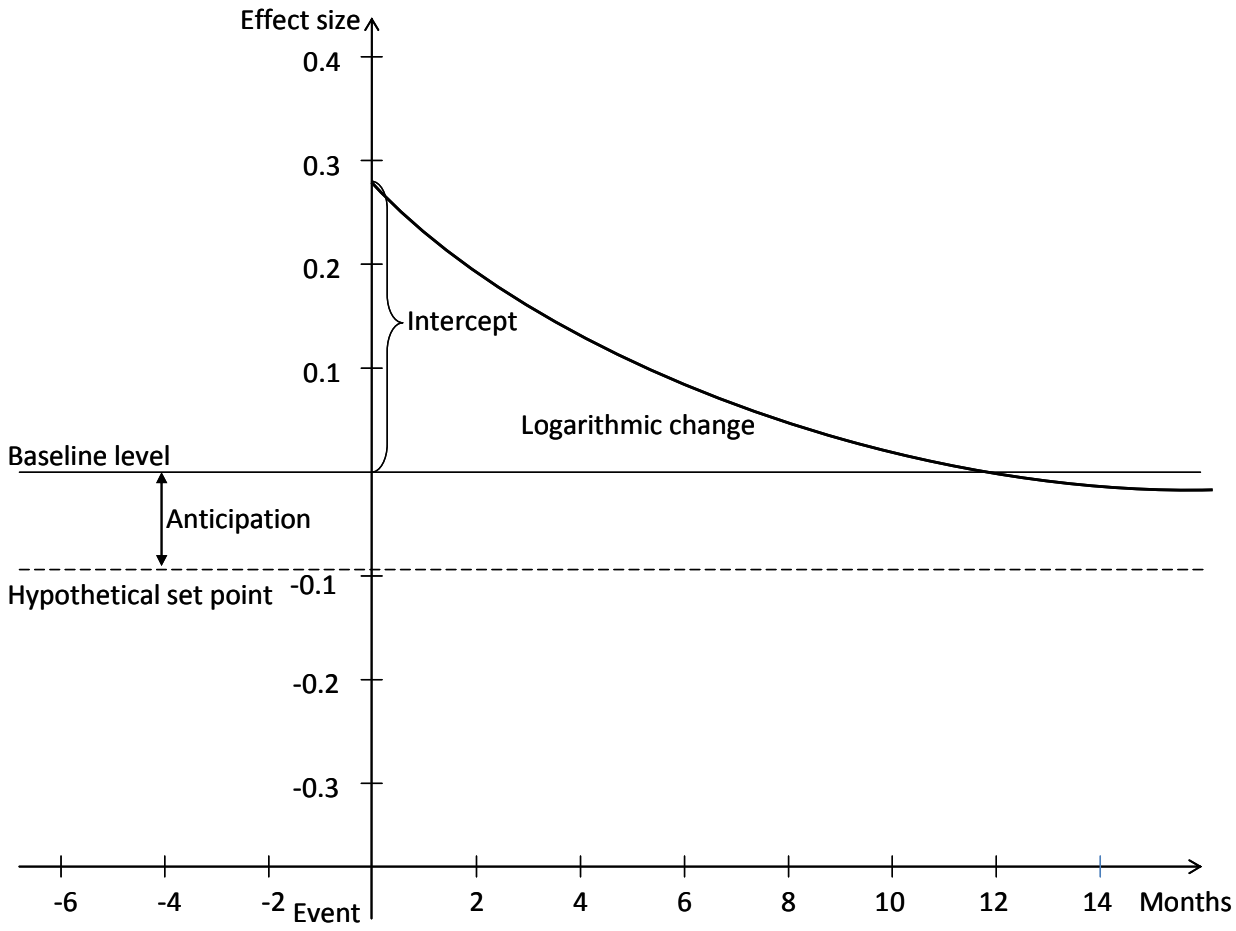


Figure 3.3. Example for a prospective adaptation pattern.

The continuous horizontal line represents the average baseline level of SWB that was assessed a couple months before the event. The dashed horizontal line represents the hypothetical set point which can differ from the baseline, for instance because of anticipatory effects. The immediate hedonic reaction to the event is reflected in the intercept of the change curve. The continuous change curve is an example for linear change. The dotted change curve is an example for logarithmic change.

In post-hoc designs, the parameters of the Adaptation Model must be interpreted differently. The values of the *time lag* between the event and the baseline are now positive (see Figure 3.2b). The parameter of this predictor is interpreted as the amount of change for the predicted effect size when the distance between the event and the baseline is *increased* by one month. The parameter of *time since the event* indicates whether any changes in SWB occurred compared to SWB shortly after the event (Research Question 2). A non-significant time effect in the post-hoc designs could indicate two very different things: (a) Adaptation was already completed within the first weeks after the event or (b) no adaptation occurs, even over long time spans. Therefore, the results of the post-hoc designs should always be interpreted together with the results of the prospective designs. Importantly, the intercept of the Adaptation Model does *not* reflect the initial hedonic reaction to the event as in prospective studies, but rather, the predicted difference between SWB at the time of the event and SWB shortly after the event. Therefore, Research Question 1 will be answered by examining prospective studies only.

In Step 2, we examined whether the hedonic impact and the rate of adaptation differed for AWB and CWB (Research Question 3) by adding a dummy variable to the Adaptation Model (0 = CWB, 1 = AWB). Both the main effect of AWB and the interaction effect with months since the event were examined. Similar to Step 2, models with linear and logarithmic change were compared because the shape of change of AWB and CWB might differ from the shape of change for all effect sizes.

In Step 3, demographic sample characteristics were examined as moderators. The percentage of males, mean age, and age-squared (age^2) were added to the Adaptation Model. In Step 4, methodological moderators were added to the Adaptation Model. Specifically, we examined whether the attrition rate, evidence for systematic drop-out (dummy-coded with 1 indicating no systematic drop-out and 0 indicating systematic drop-out or no information), and whether the data were collected explicitly for the event (dummy-coded with 1 indicating that the data were collected to study this event and 0 indicating that the data were collected for other purposes) explained any variance in the effect sizes. The continuous moderator variables attrition rate, percentage of males, and mean age were centered within each event and design. For each moderator, the main effect on the effect size as well as the interaction effect with time was tested.

Treatment of Outliers

Outliers can influence the estimation of the parameters in significant ways. Therefore, the central analyses (Step 1 through 3) were repeated using a reduced set of effect sizes without outliers. For these models, the results for the full set of effect sizes as well as for the reduced set of effect sizes will be presented together. The interpretation of the finding will be based on the full set of effect sizes unless there were substantive differences between the findings. Three types of outliers were excluded: Effect size outliers were extremely positive or negative effect sizes. Time point outliers were effect sizes that

were assessed very late after the event. Finally, sample size outliers were effect sizes that were calculated on extremely small or large samples. Technically, outliers were defined as in box plots (e. g., Agresti & Finlay, 2009): All effect sizes for which the value on the specific variable was greater than the third quartile of the distribution plus 1.5 · IQD (interquartile difference) or less than the first quartile of the distribution minus 1.5 · IQD were defined as outliers.

Sensitivity Analyses

When conducting a meta-analysis, a number of decisions have to be made. In our case, the most critical decisions concerned the replacement of missing correlation coefficients with plausible values, use of the clustering procedure in Mplus to account for statistically dependent effect sizes, and the bias correction of the effect sizes. To evaluate the degree to which these decisions affected the reported summary effect sizes, we conducted a series of sensitivity analyses. For instance, we evaluated the effect of imputing the median correlation coefficient by reanalyzing the models with (a) the first quartile correlation coefficient and (b) the third quartile correlation coefficient. By comparing the results of these analyses, the degree of bias can be estimated.

3.6 Results

In the initial literature search, no restrictions concerning the types of life events were made. The final selection of life events was based upon the frequency of studies available for the events. Only events for which more five or more samples were available were included. This applied to five family-related events (marriage, divorce, bereavement, child birth, health problems in relative) and five work-related events (unemployment, reemployment, retirement, other occupational transitions, relocation/migration) that were analyzed in the present meta-analysis.

The presentation of the results will be organized as follows: First, some general descriptive findings will be presented, followed by an analysis of potential publication bias. Then, the findings for each life event will be separately summarized and discussed. The result section concludes with the sensitivity analyses. A complete list of all studies and the respective effect sizes is offered in the Appendix.

3.6.1 Descriptive Findings

In Table 3.2, descriptive statistics on the most important variables are reported. In total, 396 samples (82,893 persons) yielding 992 effect sizes were analyzed. The number of effect sizes varied considerably across the different events. Child birth was the most frequently investigated event with 150 samples, whereas less than 20 samples were found for divorce, retirement, reemployment, and relocation/migration, respectively.

Table 3.2. Descriptive statistics.

Variable	All	Marriage	Divorce	Bereave-ment	Child birth	Health problems relative	Unem-ployment	Reem-ployment	Retire-ment	Other occupa-tional transitions	Reloca-tion and migration
Study Characteristics											
Number of samples [a]	396	37	12	48	150	47	21	16	14	33	11
Number of effects	992	198	35	122	351	87	36	29	38	60	23
Median publication year	2000	2001	2006	2002	2002	2000	1995	1999	2000	2001	2007
Affiliation in USA %	58.3	85.7	81.8	60.0	48.3	66.7	35.3	33.3	30.8	39.1	30.0
Psychological research %	39.8	84.2	44.4	36.4	43.9	12.8	43.8	44.4	41.7	70.0	55.6
Medical research %	39.8	10.5	11.1	57.6	40.2	76.9	12.5	0.0	0.0	10.0	22.2
Cited per year since publication (mean)	2.1	2.9	1.7	2.5	2.0	2.3	2.5	1.3	1.9	1.0	0.9
Design characteristics											
Mean number of time points	3.0	5.1	3.7	3.3	2.8	2.6	2.5	2.5	2.9	2.3	2.8
Studies with only 2 time points %	55.0	18.8	53.9	42.6	56.6	50.0	83.3	75.0	45.0	83.3	53.9
Prospective studies %	63.2	41.7	61.5	44.4	76.3	14.3	79.2	95.0	95.0	75.0	61.5
Timing of T1 in months (prospec-tive studies)	-5.1	-4.3	-13.6	-6.7	-2.5	-3.5	-6.9	-6.2	-6.7	-9.9	-10.1
Timing of T1 in months (post-hoc studies)	3.2	3.6	4.1	3.3	1.8	2.2	15.0	3.0	2.0	2.1	14.7

(Table continues)

Variable	All	Marriage	Divorce	Bereave-ment	Child birth	Health problems relative	Unem-ployment	Reem-ployment	Retire-ment	Other occupa-tional transitions	Reloca-tion and migration
Sample characteristics											
Total number of participants [b]	82,893	9,171	2,009	5,312	35,281	4,029	4,186	1,597	5,274	13,072	2,964
Ad-hoc samples %	83.1	94.6	75.0	81.3	93.3	100.0	47.6	56.3	71.4	48.5	63.6
Data collected for the event %	72.0	86.5	33.3	68.8	88.7	87.2	19.1	25.0	42.9	42.4	81.8
Mean attrition rate	29.0	31.9	35.7	31.8	24.8	34.8	31.5	29.1	30.7	27.9	25.5
Systematic drop-out %	1.5	0.0	0.0	0.0	2.7	2.1	0.0	0.0	0.0	3.0	0.0
No systematic drop-out %	27.3	32.4	25.0	25.0	28.0	40.4	9.5	0.0	14.3	27.3	54.6
Males %	34.9	48.6	24.3	23.8	30.6	38.1	41.5	42.9	65.9	36.3	32.1
Age: mean	36.9	26.2	38.5	55.0	29.0	53.0	29.7	28.9	58.6	23.6	44.5
Ethnicity: majority is white %	42.9	81.1	50.0	56.3	42.0	42.6	14.3	6.3	28.6	18.2	45.5
Measures											
Affective well-being %	61.0	6.3	69.2	79.6	61.6	60.7	83.3	85.0	60.0	66.7	69.2
Positive well-being %	49.0	93.8	53.9	35.2	48.0	48.2	16.7	20.0	55.0	54.2	30.8
Sample-specific reliability estimate reported %	52.2	64.6	53.9	59.3	44.4	57.1	66.7	80.0	40.0	37.5	69.2
Mean number of items in measure	14.9	14.8	11.0	12.1	16.6	23.4	14.0	11.2	9.1	10.4	10.9

Notes. [a] Some samples delivered effect sizes for multiple events. Therefore, the total number of independent samples is lower than the summed number of samples for the single events.

[b] If the sample size varied within independent samples, the median sample size across all time points was taken.

Publication Characteristics

The majority of the studies in our meta-analysis were published in the past decade. The median publication year across all events was 2002. The impact of these studies was quite high: On average, the publications were cited 2.0 times per year since publication. We also coded the first author's affiliation and discipline. More than half of the authors (56.6 %) were affiliated in the United States at the time of publication. The relative frequency of psychological and medical studies was about the same (40.0 % and 40.4 %, respectively). Not surprisingly, research on health problems of the spouse and other relatives were predominantly conducted by medical researchers.

Design Characteristics

In this meta-analysis, we only included studies with at least two measurement occasions. Three or more time points were available for 45 % of the samples. We distinguished between two types of designs: In prospective studies, the first measurement took place before the event occurred. In post-hoc studies, the first measurement took place after the event occurred. Across all events, 63.2 % of the studies were prospective. However, for bereavement, marriage, and health problems of a relative, less than 50 % were prospective.

A central question of this paper concerns the trajectory of SWB over time. Therefore, the time lags between the measurements and the event were of great importance. For prospective studies, the first measurement took place 5.1 months on average before the event. For the specific events, this number varied substantively. For instance, the average time lag between the baseline assessment and divorce was 13.6 months, whereas the average time lag between the baseline assessment and child birth was only 2.5 months. These figures have to be considered in the interpretation of the effect sizes because of potential anticipatory effects (Clark et al., 2008). For the post-hoc studies, the first measurement occurred 3.2 months after the event, on average. According to some accounts, adaptation should be completed by then (Suh et al., 1996). If we nevertheless detected mean-level changes in SWB after this time point, this would indicate that adaptation takes longer than previously assumed.

Sample Characteristics

Most of the samples were ad-hoc samples of adults (83 % across all events) that were purposefully recruited to study a specific life event (71.8 % across all events). Divorce, reemployment, and unemployment were notable exceptions: For these events, the clear majority of samples were not collected to study this event. In longitudinal studies, sample attrition is usually a concern. The mean attrition rate was similar across all events, with an average of 71.1 %. In most studies, no information about systematic difference between drop-outs and participants was given (see Table 3.1). If any information was available, it usually suggested that no systematic drop-out occurred. This finding raises the question

whether comparisons between drop-outs and participants were only reported if these groups did not differ significantly.

We also coded information about age, sex, and ethnicity of the samples. The mean percentage of males in the samples was quite low with 34.8 % across all events. It seems that longitudinal research on the life events examined in this meta-analysis was predominantly based on women. The mean age across all samples was 37.0. Mean age was higher for events that typically happen later in life, for instance, bereavement, retirement, and health problems of the relative. The predominant ethnicity of the sample was either unknown (54.0 %) or white/Caucasian (42.6 %), suggesting that racial differences in adaptation to life events have not been a prominent line of research.

Measures

For most events, measures of AWB were somewhat more frequently used than measures of CWB. Marriage was a clear exception: Only 6.3 % of the measures assessed AWB. We also examined how SWB was coded in these measures. The number of measures where high scores reflect high SWB (positive well-being) was almost equal to the number of measures where high scores reflect low SWB (negative well-being). Again, marriage was an exception: For marriage, 93.8 % of the measures reflected positive well-being. The average number of items of the measures was 14.9 across all events and did not vary much across the different events.

3.6.2 Publication Bias

To assess whether a potential publication bias might affect our findings, we regressed the effect sizes on the sample size and time since the event. The regression coefficients are reported in Table 3.3. For most events, the regression coefficient was not significantly different from zero, suggesting that publication bias is not an issue for these events. However, significant positive regression coefficients were found for marriage (prospective), child birth (prospective), and unemployment (post-hoc); and significant negative regression coefficients were found for other occupational transitions (prospective) and relocation/migration (post-hoc). For these events, the magnitude of the effect sizes varied according to the sample size, and the estimates of the meta-analytic models might be biased. For this reason, the analyses for the central research questions were conducted both with and without extremely small or large samples.

Table 3.3. Standardized regression coefficients of effect sizes regressed on sample size, controlling for the time since event.

Event	Estimate	95 % CI
Marriage prospective	0.568	[0.428, 0.708]
Marriage post-hoc	-0.017	[-0.237, 0.203]
Divorce prospective	0.266	[-0.091, 0.624]
Divorce post-hoc	-0.529	[-1.145, 0.087]
Bereavement prospective	0.039	[-0.091, 0.169]
Bereavement post-hoc	-0.235	[-0.442, -0.028]
Child birth prospective	0.072	[0.032, 0.111]
Child birth post-hoc	-0.009	[-0.113, 0.095]
Health problems relative prospective	0.367	[-0.045, 0.779]
Health problems relative post-hoc	0.092	[-0.081, 0.266]
Unemployment prospective	0.142	[-0.008, 0.292]
Unemployment post-hoc	0.557	[0.188, 0.925]
Reemployment prospective	-0.596	[-0.928, -0.263]
Retirement prospective	0.147	[-0.139, 0.434]
Other occupational transitions prospective	-0.231	[-0.372, -0.091]
Other occupational transitions post-hoc	0.375	[-0.378, 1.128]
Relocation/migration prospective	0.040	[-0.181, 0.261]
Relocation/migration post-hoc	-0.838	[-1.358, -0.318]

3.6.3 Marriage

For marriage, 17 independent prospective samples yielding 66 effect sizes and 20 independent post-hoc samples yielding 132 effect sizes were found. Compared to other events, the average number of time points in these studies was quite high, with $M = 4.2$ ($SD = 2.62$) in prospective studies and $M = 5.71$ ($SD = 2.65$) in post-hoc studies. The samples were predominantly ad-hoc samples (94.6 %) and recruited specifically to study marriage as a life event (86.5 %), especially in the post-hoc studies (99.2 %). The percentage of males and females in these samples was about equal, as would be expected in studies on marriage. The mean age of the samples was 26.2 years ($SD = 2.72$).

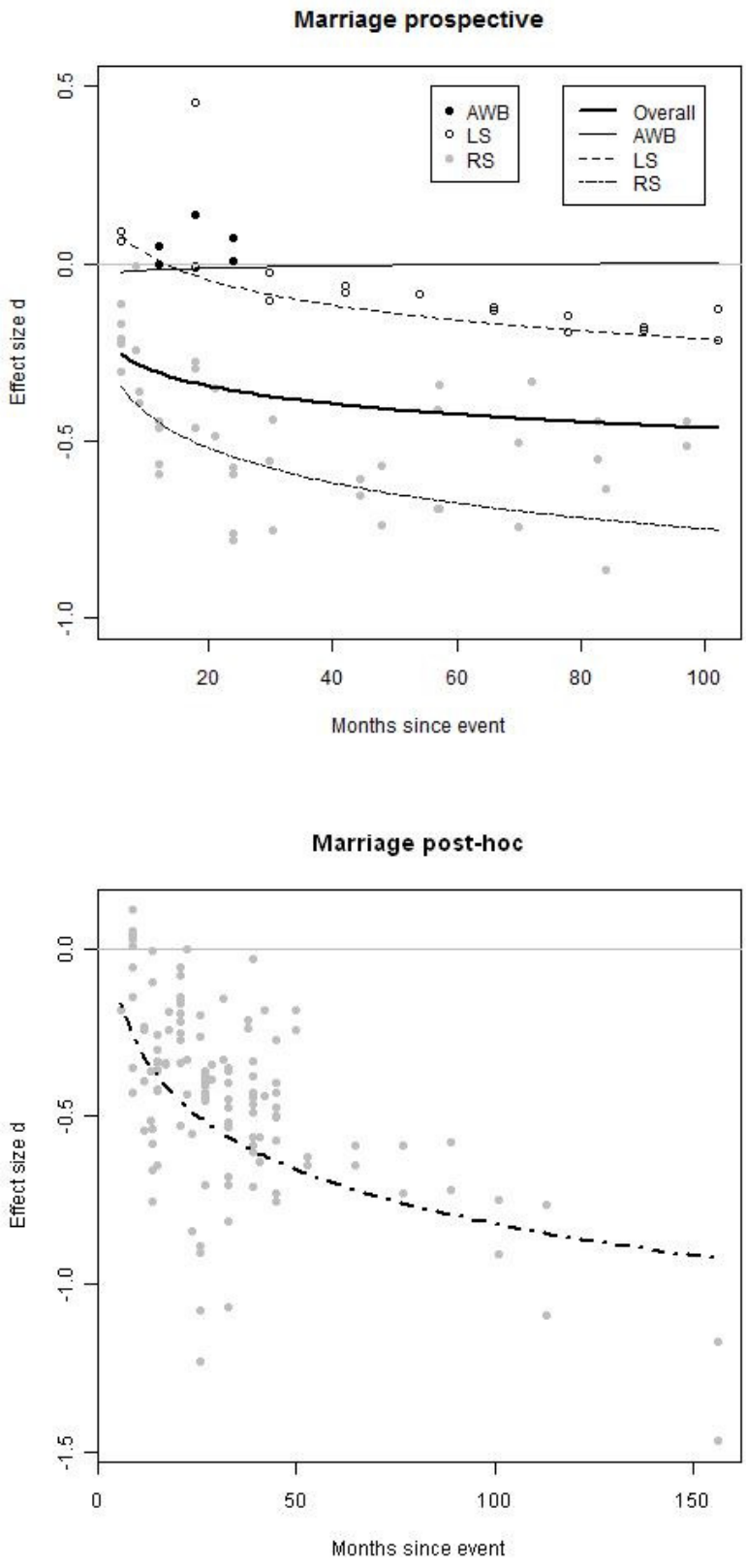


Figure 3.4. Observed effect sizes and predicted adaptation curves for marriage.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers. AWB = affective well-being, LS = life satisfaction, RS = relationship satisfaction.

Initial Hedonic Reaction

The initial hedonic reaction to marriage is reflected in the intercept of the Adaptation Model for the prospective studies (Table 3.4). It was in the negative range but not significantly different from zero, b_0 = –0.12, 95 % CI [–0.31, 0.06], indicating that SWB at the time of marriage is similar to SWB before the wedding (M = 4.29 months before marriage, SD = 5.36).

Adaptation

For prospective studies, the logarithmic change parameter in the Adaptation Model (Table 3.4) was b_1 = –0.07, 95 % CI [–0.15, 0.00], indicating a marginally significant downward trend of SWB after marriage. The time lag between the baseline and the event did not account for any variance in the prospective effect sizes, b_2 = –0.02, 95 % CI [–0.05, 0.01].

Post-hoc effect sizes describe mean-level changes between SWB shortly after the event (M = 3.63 months, SD = 3.41) and SWB at later time points. Whereas measures for life satisfaction, relationship satisfaction, and AWB were available for the prospective studies, relationship satisfaction was the only outcome variable in the post-hoc studies. For these studies, the change parameter was b_1 = –0.23, 95 % CI [–0.29, –0.18], suggesting that relationship satisfaction decreases significantly after the wedding. The parameter for the time lag between event and baseline was positive, b_2 = 0.03, 95 % CI [0.01, 0.05], indicating that the effect sizes were less negative in studies where first measurement occurred rather late after marriage.

Together, these findings show that most of the decrease in relationship satisfaction takes place during the first months after marriage. The predicted adaptation curves for prospective and post-hoc studies are shown in Figure 3.4.

AWB vs. CWB

To compare the impact of marriage on different components of SWB, two dummy variables reflecting AWB and relationship satisfaction were added to the prospective Adaptation Model. Life satisfaction was the reference category. In the first model (first column in Table 3.5), only main effects of these variables were included. In the second model (second column in Table 3.5), interaction effects were added. At this point, only the results of the second model will be summarized. The predicted adaptation curves for the different components are plotted in Figure 3.4.

The results showed that life satisfaction right after the event was higher than before the event, b_0 = 0.27, 95 % CI [0.14, 0.40], and decreased over the following months, b_1 = –0.10, 95 % CI [–0.13, –0.08]. The effect of AWB was negative, b_3 = –0.31, 95 % CI [–0.42, –0.19]. As this parameter reflects

the difference between the intercepts of AWB and life satisfaction, the intercept for the adaptation curve of AWB was close to zero which indicates that AWB after the wedding was similar to AWB before the wedding. The positive interaction effect of AWB with time b_5 reflects the difference between the slope for AWB and the slope for life satisfaction b_1. The parameter of the interaction was positive, b_5 = 0.11, 95 % CI [0.09, 0.14] which means that AWB did not change over time. Thus, neither a significant initial hedonic reaction nor a significant adaptation trajectory was observed for AWB. It has to be kept in mind, however, that these estimates were based on three effect sizes only.

Similarly to AWB, the parameters for relationship satisfaction must also be interpreted in relation to the parameters for life satisfaction. Thus, the main effect of relationship satisfaction, b_4 = –0.49, 95 % CI [–0.59, –0.39], needs to interpreted with respect to b_0 = –0.27. It indicates that the initial hedonic reaction of relationship satisfaction was negative. The interaction effect b_6 = –0.04, 95 % CI [–0.11, –0.03] needs to interpreted with respect to b_1 = –0.10. This result shows that relationship satisfaction decreased faster after marriage than life satisfaction.

In post-hoc studies, relationship satisfaction was the only outcome. Similarly to the prospective findings on relationship satisfaction, a significant downward trend in relationship satisfaction was found (see previous section).

Additional Moderator Analyses

Gender did not account for any variance of the effect sizes of the prospective or post-hoc designs (Table 3.6). However, we found an interesting pattern for age. When only main effects were included in the model (first and third columns in Table 3.6), a positive linear effect of age was found in both designs, indicating a more positive reaction to marriage for older people. Moreover, a positive effect of age^2 was found in the prospective studies, suggesting that the reaction to marriage was most negative in samples of average age. When interaction effects were added (second and fourth column in Table 3.6), only the linear effect of age in the post-hoc studies prevailed. For prospective studies, a positive interaction effect of age^2 and time was detected. This effect suggests that adaptation was fastest (as indicated by the steepest decrease in SWB) in samples of average age. Together, these results show that older age is associated with higher SWB after marriage.

Including all methodological moderators in one model led to improper solutions for both the prospective and the post-hoc studies. Therefore, we conducted several separate analyses (Table 3.7). The findings were inconsistent for prospective and post-hoc studies. In a model containing only main effects, attrition was positively related to the effect sizes in prospective studies and negatively related to the effect sizes in post-hoc studies. Post-hoc samples that were not affected by systematic drop-out had more positive effect sizes. No effect of systematic drop-out was found for the prospective studies. Fi-

nally, prospective effect sizes were smaller when the data were collected to study marriage whereas post-hoc effect sizes were not affected by the purpose of the study.

Discussion

Do people adapt to marriage? Our findings show that the answer depends on which component of SWB is considered. CWB declines over the years following marriage, regardless of whether relationship satisfaction or global life satisfaction is examined. Overall, CWB after the event is lower than before the event. This does not necessarily mean that getting married makes people unhappy. Rather, it can be assumed that shortly before the marriage, CWB is higher than usual (Clark et al., 2008; Lucas et al., 2003). Our findings show that this "honeymoon effect" is of short duration, and adaptation starts quickly. The pattern for AWB was a little different, but due to the low number of effect sizes for AWB, this finding should be interpreted with caution.

Does getting married have different effects on SWB in different age groups? Our findings suggest that this is the case. The effect sizes were more positive in samples of higher mean age. Apparently, getting married later than average is beneficial for SWB.

Table 3.4. Meta-analytic results for the Adaptation Model.

	Prospective all		**Post-hoc all**		**Prospective without outliers**		**Post-hoc without outliers**	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Marriage								
Intercept b_0	-0.12	[-0.31, 0.06]	0.26	[0.03, 0.49]	-0.20	[-0.44, 0.05]	0.09	[-0.20, 0.37]
Months since event b_1	-0.07	[-0.15, 0.00]	-0.23	[-0.29, -0.18]	-0.05	[-0.15, 0.05]	-0.17	[-0.25, -0.09]
Lag baseline/ event b_2	-0.02	[-0.05, 0.01]	0.03	[0.01, 0.05]	-0.01	[-0.06, 0.03]	0.02	[0.01, 0.04]
k (*n*)	66 (17)		132 (20)		60 (16)		119 (20)	
Divorce								
Intercept b_0	-0.07	[-0.15, -0.00]	-0.04	[-0.68, 0.60]	-0.07	[-0.15, -0.00]	0.25	[-3.57, 4.06]
Months since event b_1	0.07	[0.05, 0.09]	0.00	[-0.05, 0.05]	0.07	[0.05, 0.09]	0.08	[-1.68, 1.84]
Lag baseline/ event b_2	0.00	[0.00, 0.01]	0.05	[-0.07, 0.18]	0.00	[0.00, 0.01]	-0.04	[-0.37, 0.29]
k (*n*)	24 (7)		11 (5)		22 (5)		7 (4)	
Bereavement								
Intercept b_0	-0.18	[-0.43, 0.07]	-0.10	[-0.29, 0.08]	-0.05	[-0.31, 0.21]	0.02	[-0.16, 0.20]
Months since event b_1	0.08	[0.02, 0.14]	0.13	[0.07, 0.19]	0.04	[-0.02, 0.10]	0.07	[0.00, 0.13]
Lag baseline/ event b_2	0.01	[-0.01, 0.04]	-0.01	[-0.04, 0.02]	0.01	[-0.01, 0.04]	0.00	[-0.03, 0.02]
k (*n*)	61 (21)		61 (27)		44 (20)		52 (26)	
Child birth								
Intercept b_0	0.02	[-0.07, 0.11]	0.23	[0.04, 0.43]	0.01	[-0.12, 0.14]	0.12	[-0.12, 0.35]
Months since event b_1	-0.04	[-0.08, 0.00]	-0.03	[-0.13, 0.06]	-0.03	[-0.08, 0.01]	0.01	[-0.10, 0.13]
Lag baseline/ event b_2	0.00	[-0.02, 0.02]	-0.06	[-0.10, -0.02]	0.00	[-0.04, 0.05]	-0.04	[-0.08, -0.01]
k (*n*)	267 (111)		84 (39)		232 (100)		59 (28)	

	Prospective all		Post-hoc all		Prospective without outliers		Post-hoc without outliers	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Health problems relative								
Intercept b_0	0.10	[-0.01, 0.20]	-0.02	[-0.24, 0.21]	No outliers		0.15	[-0.04, 0.34]
Months since event b_1	0.12	[0.06, 0.18]	0.09	[-0.08, 0.26]			-0.05	[-0.15, 0.05]
Lag baseline/ event b_2	0.02	[0.01, 0.03]	-0.03	[-0.08, 0.01]			-0.01	[-0.03, 0.01]
k (n)	12 (6)		75 (14)				61 (37)	
Unemployment								
Intercept b_0	-0.32	[-0.57, -0.06]	No convergence		-0.35	[-0.53, -0.18]	No outliers	
Months since event b_1	0.08	[0.02, 0.15]			0.09	[0.03, 0.14]		
Lag baseline/ event b_2	0.00	[-0.01, 0.01]			-0.00	[-0.01, 0.00]		
k (n)	30 (17)				20 (14)			
Reemployment								
Intercept b_0	-0.04	[-0.22, 0.13]			No outliers			
Months since event b_1	0.06	[0.01, 0.11]						
Lag baseline/ event b_2	-0.02	[-0.03, -0.01]						
k (n)	27 (15)							
Retirement								
Intercept b_0	-0.20	[-0.49, 0.10]			-0.10	[-0.35, 0.15]		
Months since event b_1	0.06	[-0.02, 0.14]			0.03	[-0.03, 0.09]		
Lag baseline/ event b_2	-0.02	[-0.04, 0.00]			-0.02	[-0.03, -0.00]		
k (n)	35 (13)				33 (13)			
Other occupational transitions								
Intercept b_0	-0.01	[-0.16, 0.14]	0.22	[0.15, 0.29]	0.00	[-0.18, 0.18]	0.20	[0.12, 0.29]
Months since event b_1	0.05	[-0.03, 0.13]	-0.26	[-0.39, -0.13]	0.07	[-0.04, 0.17]	-0.29	[-0.51, -0.07]
Lag baseline/ event b_2	0.00	[-0.02, 0.01]	0.07	[0.02, 0.11]	0.00	[-0.01, 0.02]	0.14	[-0.09, 0.36]
k (n)	43 (26)		17 (8)		33 (22)		14 (6)	

	Prospective all		Post-hoc all		Prospective without outliers		Post-hoc without outliers	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Relocation/ migration								
Intercept b_0	0.24	[0.14, 0.33]	No convergence		0.26	[0.17, 0.35]	No convergence	
Months since event b_1	0.05	[0.02, 0.09]			0.05	[0.02, 0.08]		
Lag baseline/ event b_2	0.01	[0.00, 0.01]			0.01	[0.00, 0.01]		
k (*n*)	13 (6)				11 (5)			

Notes. *k* = number of effect sizes, *n* = number of independent samples.

Table 3.5. Meta-analytic results for the AWB vs. CWB models.

	Prospective: only main effects		Prospective: main and interaction effects		Post-hoc: only main effects		Post-hoc: main and interaction effects	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Marriage								
Intercept b_0	0.33	[0.16, 0.49]	0.27	[0.14, 0.40]				
Months since event b_1	-0.12	[-0.16, -0.08]	-0.10	[-0.13, -0.08]				
Lag baseline/ event b_2	-0.02	[-0.02, -0.01]	-0.02	[-0.02, -0.01]				
AWB b_3	0.00	[-0.11, 0.11]	-0.31	[-0.42, -0.19]				
RS b_4	-0.49	[-0.59, -0.39]	-0.36	[-0.61, -0.12]				
AWB * Months b_5			0.11	[0.09, 0.14]				
RS * Months b_6			-0.04	[-0.11, 0.03]				
k (*n*)	66 (17)		66 (17)					
Bereavement								
Intercept b_0	-0.49	[-0.71, -0.27]	-0.38	[-0.59, -0.17]	-0.20	[-0.34, -0.06]	-0.25	[-0.39, -0.10]
Months since event b_1	0.16	[0.10, 0.22]	0.13	[0.09, 0.17]	0.13	[0.07, 0.19]	0.15	[0.05, 0.25]
Lag baseline/ event b_2	0.03	[0.01, 0.06]	0.04	[0.01, 0.06]	-0.03	[-0.05, -0.00]	-0.03	[-0.05, -0.00]
AWB b_3	0.38	[0.19, 0.57]	0.23	[-0.08, 0.53]	0.22	[0.04, 0.39]	0.28	[0.02, 0.54]
AWB * Months b_4			0.06	[-0.06, 0.18]			-0.03	[-0.14, 0.09]
k (*n*)	61 (21)		61 (21)		61 (27)		61 (27)	

	Prospective: only main effects		Prospective: main and interaction effects		Post-hoc: only main effects		Post-hoc: main and interaction effects	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Child birth								
Intercept b_0	-0.20	[-0.38, -0.02]	0.50	[0.16, 0.85]	0.03	[-0.21, 0.28]	0.53	[0.31, 0.75]
Months since event b_1	0.01	[-0.03, 0.05]	-0.19	[-0.28, -0.11]	-0.04	[-0.14, 0.05]	-0.26	[-0.39, -0.13]
Lag baseline/ event b_2	0.00	[-0.01, 0.02]	0.01	[-0.01, 0.02]	-0.03	[-0.08, 0.01]	-0.02	[-0.07, 0.03]
AWB b_3	0.32	[0.18, 0.47]	-0.43	[-0.78, -0.08]	0.21	[0.01, 0.42]	-0.39	[-0.67, -0.10]
RS b_4	-0.14	[-0.29, 0.00]	-0.55	[-0.87, -0.23]				
AWB * Months b_5			0.25	[0.15, 0.34]			0.26	[0.12, 0.40]
RS * Months b_6			0.00	[-0.00, 0.01]				
k (*n*)	267 (111)		267 (111)		84 (39)		84 (39)	
Health problems relative								
Intercept b_0	-0.08	[-0.11, -0.04]	-0.01	[-0.11, 0.10]	-0.22	[-0.48, 0.05]	-0.08	[-0.28, 0.13]
Months since event b_1	0.10	[0.06, 0.13]	0.00	[-0.01, 0.01]	0.09	[-0.05, 0.23]	0.02	[-0.08, 0.12]
Lag baseline/ event b_2	0.02	[0.02, 0.03]	0.01	[-0.01, 0.02]	-0.03	[-0.06, 0.00]	-0.03	[-0.06, 0.00]
AWB b_3	0.28	[0.18, 0.39]	-0.08	[-0.32, 0.17]	0.34	[0.16, 0.52]	0.10	[-0.21, 0.42]
AWB * Months b_4			0.04	[0.03, 0.06]			0.12	[-0.06, 0.29]
k (*n*)	12 (6)		12 (6)		75 (14)		75 (14)	
Unemployment								
Intercept b_0	-0.22	[-0.55, 0.11]	-0.43	[-0.48, -0.38]	Not analyzed		Not analyzed	
Months since event b_1	0.06	[-0.03, 0.15]	0.12	[0.10, 0.13]				
Lag baseline/ event b_2	0.00	[-0.01, 0.01]	-0.01	[-0.01, 0.00]				
AWB b_3	-0.10	[-0.28, 0.08]	0.18	[-0.08, 0.45]				
AWB * Months b_4			-0.11	[-0.20, -0.01]				
k (*n*)	30 (17)		30 (17)					

	Prospective: only main effects		Prospective: main and interaction effects		Post-hoc: only main effects		Post-hoc: main and interaction effects	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Reemployment								
Intercept b_0	-0.19	[-0.22, -0.15]	-0.21	[-0.22, -0.19]				
Months since event b_1	0.07	[0.03, 0.10]	0.09	[0.08, 0.10]				
Lag baseline/ event b_2	-0.01	[-0.02, 0.01]	-0.01	[-0.03, 0.00]				
AWB b_3	0.24	[0.11, 0.37]	0.28	[0.12, 0.45]				
AWB * Months b_4			-0.05	[-0.10, -0.00]				
k (*n*)	27 (15)		27 (15)					
Retirement								
Intercept b_0	-0.29	[-0.54, -0.04]	-0.22	[-0.44, 0.02]				
Months since event b_1	0.07	[0.01, 0.13]	0.04	[-0.01, 0.10]				
Lag baseline/ event b_2	-0.01	[-0.03, 0.01]	-0.01	[-0.03, 0.01]				
AWB b_3	0.24	[0.06, 0.41]	0.07	[-0.35, 0.49]				
AWB * Months b_4			0.06	[-0.06, 0.18]				
k (*n*)	35 (13)		35 (13)					
Other occupational transitions								
Intercept b_0	0.01	[-0.18, 0.19]	-0.45	[-1.29, 0.40]	0.22	[0.10, 0.34]	0.25	[0.13, 0.38]
Months since event b_1	0.05	[-0.03, 0.13]	0.23	[-0.12, 0.58]	-0.26	[-0.36, -0.16]	-0.30	[-0.52, -0.07]
Lag baseline/ event b_2	0.00	[-0.02, 0.01]	0.00	[-0.01, 0.01]	0.07	[0.03, 0.11]	0.08	[0.00, 0.15]
AWB b_3	-0.02	[-0.15, 0.11]	0.46	[-0.37, 1.29]	0.01	[-0.43, 0.46]	-0.06	[-0.26, 0.14]
AWB * Months b_4			-0.19	[-0.51, 0.14]			0.06	[-0.21, 0.32]
k (*n*)	43 (26)		43 (26)		17 (8)		17 (8)	

	Prospective: only main effects		Prospective: main and interaction effects		Post-hoc: only main effects		Post-hoc: main and interaction effects	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Relocation/migration								
Intercept b_0	0.50	[-4.35, 5.35]	No convergence		Not analyzed		Not analyzed	
Months since event b_1	0.07	[-0.33, 0.47]						
Lag baseline/ event b_2	0.02	[-0.09, 0.12]						
AWB b_3	-0.27	[-3.71, 3.17]						
AWB * Months b_4								
k (*n*)	13 (6)							

Notes. AWB = Affective well-being, CWB = Cognitive well-being, LS = life satisfaction, RS = relationship satisfaction, *k* = number of effect sizes, *n* = number of independent samples.

Table 3.6. Meta-analytic results for demographic moderators.

	Prospective: only main effects		Prospective: main and interaction effects		Post-hoc: only main effects		Post-hoc: main and interaction effects	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Marriage								
Intercept b_0	-0.10	[-0.33, 0.14]	0.17	[-0.14, 0.48]	0.43	[0.24, 0.61]	0.50	[0.30, 0.70]
Months since event b_1	-0.14	[-0.20, -0.09]	-0.23	[-0.30, -0.15]	-0.27	[-0.32, -0.21]	-0.29	[-0.35, -0.23]
Lag baseline/ event b_2	-0.01	[-0.02, 0.01]	0.00	[-0.02, 0.01]	0.01	[0.00, 0.02]	0.01	[0.00, 0.02]
Males b_3	-0.06	[-0.20, 0.08]	-0.10	[-0.56, 0.36]	-0.06	[-0.21, 0.10]	-0.24	[-0.73, 0.24]
Age b_4	0.04	[0.02, 0.07]	0.01	[-0.06, 0.07]	0.05	[0.02, 0.08]	0.11	[0.02, 0.21]
Age² b_5	0.03	[0.02, 0.05]	-0.01	[-0.05, 0.03]	-0.00	[-0.01, 0.00]	-0.02	[-0.03, -0.00]
Males * Months b_6			0.02	[-0.10, 0.13]			0.06	[-0.08, 0.19]
Age * Months b_7			0.01	[-0.01, 0.03]			-0.02	[-0.05, 0.01]
Age² * Months b_8			0.02	[0.01, 0.02]			0.00	[-0.00, 0.01]
k (*n*)	55 (15)		55 (15)		132 (20)		132 (20)	

	Prospective: only main effects		Prospective: main and interaction effects		Post-hoc: only main effects		Post-hoc: main and interaction effects	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Bereavement								
Intercept b_0	-0.08	[-0.45, 0.31]	-0.10	[-0.80, 0.60]	-0.04	[-0.22, 0.14]	-0.10	[-0.33, 0.13]
Months since event b_1	0.09	[-0.02, 0.19]	0.09	[-0.06, 0.24]	0.18	[0.11, 0.25]	0.21	[0.12, 0.29]
Lag baseline/ event b_2	0.01	[-0.08, 0.11]	0.02	[-0.08, 0.12]	-0.04	[-0.06, -0.01]	-0.04	[-0.06, -0.01]
Males b_3	-0.21	[-2.02, 1.61]	0.57	[-2.69, 3.82]	-0.14	[-0.32, 0.04]	-0.06	[-0.79, 0.68]
Age b_4	-0.02	[-0.05, 0.00]	-0.03	[-0.08, 0.02]	0.01	[-0.00, 0.01]	0.01	[-0.01, 0.02]
Age² b_5	0.00	[-0.00, 0.00]	0.00	[-0.01, 0.01]	-0.00	[-0.00, 0.00]	-0.00	[-0.00, 0.00]
Males * Months b_6			-0.33	[-1.32, 0.67]			-0.03	[-0.25, 0.18]
Age * Months b_7			0.01	[-0.02, 0.03]			-0.00	[-0.01, 0.01]
Age² * Months b_8			-0.00	[-0.00, 0.00]			-0.00	[-0.00, 0.00]
k (*n*)	33 (13)		33 (13)		43 (20)		43 (20)	
Child birth								
Intercept b_0	0.09	[-0.05, 0.23]	0.06	[-0.09, 0.21]	0.26	[0.05, 0.47]	0.15	[-0.08, 0.37]
Months since event b_1	-0.05	[-0.10, 0.00]	-0.03	[-0.09, 0.03]	-0.08	[-0.19, 0.02]	-0.04	[-0.14, 0.05]
Lag baseline/ event b_2	0.02	[-0.02, 0.07]	0.02	[-0.03, 0.06]	-0.03	[-0.07, 0.00]	-0.02	[-0.05, 0.02]
Males b_3	0.03	[-0.13, 0.18]	0.03	[-0.21, 0.26]	-0.08	[-0.26, 0.10]	0.63	[0.32, 0.94]
Age b_4	0.01	[-0.03, 0.04]	0.04	[-0.02, 0.09]	0.01	[-0.04, 0.05]	0.01	[-0.05, 0.06]
Age² b_5	0.00	[-0.00, 0.00]	0.01	[-0.00, 0.01]	-0.00	[0.00, 0.01]	0.06	[0.01, 0.11]
Males * Months b_6			-0.01	[-0.13, 0.11]			-0.33	[-0.49, -0.16]
Age * Months b_7			-0.02	[-0.05, 0.01]			0.00	[-0.04, 0.03]
Age² * Months b_8			-0.00	[-0.01, 0.00]			-0.02	[-0.04, -0.00]
k (*n*)	220 (95)		220 (95)		67 (33)		67 (33)	

	Prospective: only main effects		Prospective: main and interaction effects		Post-hoc: only main effects		Post-hoc: main and interaction effects	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Health problems relative								
Intercept b_0	No convergence		No convergence		-0.09	[-0.31, 0.13]	-0.06	[-0.25, 0.13]
Months since event b_1					0.10	[-0.03, 0.23]	0.08	[0.01, 0.15]
Lag baseline/ event b_2					-0.03	[-0.06, 0.00]	-0.02	[-0.05, 0.01]
Males b_3					-0.10	[-0.41, 0.20]	-0.21	[-0.58, 0.16]
Age b_4					-0.01	[-0.02, 0.01]	0.02	[-0.02, 0.06]
Age² b_5					0.00	[-0.00, 0.00]	0.00	[-0.00, 0.01]
Males * Months b_6							0.05	[-0.12, 0.22]
Age * Months b_7							-0.01	[-0.03, 0.01]
Age² * Months b_8							-0.00	[-0.00, 0.00]
k (*n*)					56 (30)		56 (30)	
Unemployment								
Intercept b_0	0.52	[-0.03, 1.07]	Improper solution		No convergence		No convergence	
Months since event b_1	-0.11	[-0.15, -0.06]						
Lag baseline/ event b_2	0.05	[0.00, 0.10]						
Males b_3	-0.37	[-0.67, -0.08]						
Age b_4	0.02	[0.00, 0.04]						
Age² b_5	0.00	[0.00, 0.00]						
k (*n*)	13 (10)							
Reemployment								
Intercept	-0.13	[-0.30, 0.04]	No convergence					
Months since event	0.07	[0.07, 0.08]						
Lag baseline/event	0.01	[-0.00, 0.03]						
Males	0.74	[0.38, 1.11]						
Age	0.04	[0.01, 0.07]						
Age²	0.00	[-0.00, 0.01]						
k (*n*)	20 (8)							

	Prospective: only main effects		Prospective: main and interaction effects		Post-hoc: only main effects		Post-hoc: main and interaction effects	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Retirement								
Intercept b_0	-0.18	[-1.01, 0.64]	Improper solution					
Months since event b_1	0.04	[-0.12, 0.21]						
Lag baseline/ event b_2	-0.01	[-0.05, 0.03]						
Males b_3	0.78	[-1.12, 2.68]						
Age b_4	-0.08	[-0.26, 0.11]						
Age² b_5	0.01	[0.00, 0.02]						
k (*n*)	18 (8)							
Other occupational transitions								
Intercept b_0	-0.04	[-0.38, 0.30]	0.44	[0.09, 0.80]	No convergence		No convergence	
Months since event b_1	0.09	[-0.02, 0.19]	-0.12	[-0.22, -0.03]				
Lag baseline/ event b_2	0.01	[-0.02, 0.05]	0.01	[-0.01, 0.02]				
Males b_3	0.34	[-0.07, 0.75]	1.13	[0.07, 2.19]				
Age b_4	-0.01	[-0.02, 0.01]	0.48	[0.31, 0.65]				
Age² b_5	0.00	[-0.00, 0.00]	0.05	[0.04, 0.07]				
Males * Months b_6			-0.29	[-0.67, 0.09]				
Age * Months b_7			-0.23	[-0.31, -0.15]				
Age² * Months b_8			-0.03	[-0.03, -0.02]				
k (*n*)	20 (12)		20 (12)					

Notes. *k* = number of effect sizes, *n* = number of independent samples. Males is the proportion of males in the sample and runs from 0 to 1. Due to the low number of effect sizes, no moderator analyses were conducted for divorce and relocation/migration.

Table 3.7. Meta-analytic results for the methodological moderators.

	Prospective 1		**Prospective 2**		**Post-hoc 1**		**Post-hoc 2**	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Marriage								
Intercept b_0	0.20	[0.02, 0.37]	0.25	[-0.06, 0.56]	0.03	[-0.34, 0.39]	-0.02	[-1.44, 1.40]
Months since event b_1	-0.20	[-0.25, -0.14]	-0.11	[-0.17, -0.05]	-0.21	[-0.28, -0.14]	-0.24	[-0.31, -0.17]
Lag baseline/ event b_2	0.02	[0.00, 0.03]	-0.01	[-0.03, 0.00]	0.07	[-0.04, 0.17]	0.04	[-0.04, 0.12]
Attrition b_3	0.84	[0.10, 1.59]			-0.75	[-1.40, -0.09]		
No systematic drop-out b_4	0.18	[-0.04, 0.40]			0.37	[0.08, 0.67]		
Data for this event b_5			-0.36	[-0.50, -0.22]			0.27	[-0.97, 1.50]
k (*n*)	43 (13)		66 (17)		116 (16)		132 (20)	
Bereavement								
Intercept b_0	Improper solution		No convergence		0.16	[-0.41, 0.72]	0.68	[-1.36, 2.73]
Months since event b_1					0.17	[0.08, 0.25]	-0.04	[-0.79, 0.72]
Lag baseline/ event b_2					-0.02	[-0.06, 0.03]	-0.02	[-0.07, 0.03]
Attrition b_3					-0.72	[-1.76, 0.31]	-1.56	[-5.57, 2.46]
No systematic drop-out b_4					0.00	[-0.38, 0.37]	0.24	[-1.47, 1.94]
Data for this event b_5					-0.39	[-1.07, 0.28]	-1.12	[-4.54, 2.30]
Attrition * Months b_6							0.35	[-1.17, 1.86]
No systematic drop-out * Months b_7							-0.10	[-0.71, 0.52]
Data for this event * Months b_8							0.28	[-0.98, 1.55]
k (*n*)					43 (17)		43 (17)	

	Prospective 1		Prospective 2		Post-hoc 1		Post-hoc 2	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Child birth								
Intercept b_0	0.32	[0.20, 0.43]	0.21	[0.02, 0.41]	0.36	[0.20, 0.52]	0.30	[-2.29, 2.89]
Months since event b_1	-0.03	[-0.08, 0.03]	0.06	[-0.04, 0.15]	-0.01	[-0.07, 0.06]	0.02	[-1.28, 1.32]
Lag baseline/ event b_2	0.02	[-0.03, 0.06]	0.02	[-0.03, 0.06]	-0.07	[-0.11, -0.02]	-0.08	[-0.19, 0.03]
Attrition b_3	0.07	[-0.44, 0.57]	0.94	[0.49, 1.40]	-0.10	[-0.44, 0.24]	-0.72	[-8.04, 6.60]
No systematic drop-out b_4	-0.10	[-0.26, 0.07]	0.22	[0.04, 0.40]	-0.30	[-0.40, -0.19]	-0.34	[-1.91, 1.23]
Data for this event b_5	-0.24	[-0.33, -0.14]	-0.21	[-0.42, 0.01]	-0.17	[-0.26, -0.08]	-0.06	[-1.85, 1.74]
Attrition * Months b_6			-0.41	[-0.64, -0.17]			0.23	[-3.36, 3.83]
No systematic drop-out * Months b_7			-0.20	[-0.32, -0.08]			0.03	[-0.82, 0.89]
Data for this event * Months b_8			-0.03	[-0.13, 0.08]			-0.04	[-0.97, 0.89]
k (*n*)	179 (74)		179 (74)		41 (21)		41 (21)	
Health problems relative								
Intercept b_0	No convergence		No convergence		-0.26	[-0.61, 0.10]	-0.25	[-0.73, 0.24]
Months since event b_1					0.17	[-0.02,0.37]	0.16	[-0.09, 0.42]
Lag baseline/ event b_2					-0.05	[-0.09, -0.00]	-0.05	[-0.09, -0.00]
Attrition b_3					-0.95	[-1.59, -0.32]	0.04	[-2.07, 2.16]
No systematic drop-out b_4					0.08	[-0.12, 0.29]	-0.13	[-0.56, 0.30]
Data for this event b_5					0.08	[-0.05, 0.21]	0.23	[-0.31, 0.76]
Attrition * Months b_6							-0.44	[-1.31, 0.44]
No systematic drop-out * Months b_7							0.11	[-0.09, 0.31]
Data for this event * Months b_8							-0.07	[-0.32, 0.18]
k (*n*)					55 (29)		55 (29)	

	Prospective 1		Prospective 2		Post-hoc 1		Post-hoc 2	
	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI	Est.	95 % CI
Unemployment								
Intercept b_0	-0.31	[-0.71, 0.09]	-0.31	[-0.71, 0.10]	No convergence		No convergence	
Months since event b_1	0.08	[-0.02, 0.18]	0.08	[-0.02, 0.19]				
Lag baseline/ event b_2	0.00	[-0.01, 0.01]	0.00	[-0.01, 0.02]				
Data for this event b_5	-0.01	[-0.35, 0.32]	-0.12	[-0.57, 0.34]				
Data for this event * Months b_8			-0.13	[-0.20, -0.07]				
k (*n*)	30 (17)		30 (17)					
Other occupational transitions								
Intercept b_0	-0.19	[-0.46, 0.09]	No convergence		1.48	[-0.93, 3.88]	Improper solution	
Months since event b_1	0.09	[-0.09, 0.27]			-0.27	[-0.54, -0.01]		
Lag baseline/ event b_2	-0.01	[-0.03, 0.01]			-1.24	[-3.28, 0.81]		
Attrition b_3	-0.62	[-1.44, 0.21]			-0.67	[-1.71, 0.37]		
No systematic drop-out b_4	-0.46	[-0.62, -0.30]			-1.03	[-2.74, 0.67]		
Data for this event b_5	0.33	[0.28, 0.37]						
k (*n*)	21 (9)							

Notes. *k* = number of effect sizes, *n* = number of independent samples. Attrition rate is the proportion of participants lost through drop-out and runs from 0 to 1. Due to the low number of effect sizes, no moderator analyses were conducted for divorce, reemployment, retirement, and relocation/migration.

3.6.4 Divorce

For divorce, 7 independent prospective samples yielding 24 effect sizes and 5 independent post-hoc samples yielding 11 effect sizes were found. Although scientific interest in divorce is not new (e. g., Krumrei, Coit, Martin, Fogo, & Mahoney, 2007), only few longitudinal studies assessing SWB have been published, most of them in the recent years (median publication year: 2006). In contrast to the studies on marriage, most divorce studies (66.7 %) were based on data that were originally collected for other purposes. The average number of time points was 4.00 (*SD* = 3.70) for the prospective studies

and 3.20 (*SD* = 0.84) for the post-hoc studies. The average percentage of males in these samples was rather low (24.3 %). The mean age of the samples was 38.5 years (*SD* = 2.08).

Initial Hedonic Reaction

The initial hedonic reaction to divorce is reflected in the intercept of the Adaptation Model (Table 3.4) for the prospective studies. It was b_0 = –0.07, 95 % CI [–0.15, –0.00], indicating that SWB is significantly lower at the time of divorce, compared to, on average, 13.56 months (*SD* = 7.57) before divorce.

Adaptation

The trajectory of the prospective effect sizes was positive, b_1 = 0.07, 95 % CI [0.05, 0.09], which means that SWB tends to increase after divorce. The parameter for the time lag between baseline and divorce was small but positive and significant, b_2 = 0.00, 95 % CI [0.00, 0.01]. As greater values on this variable indicate a smaller time lag between the baseline and the event, this parameter indicates that the effect sizes tended to be more positive in studies where the first measurement took place not long before the divorce.

Post-hoc studies reflect mean-level differences between SWB at, on average, 4.06 months (*SD* = 2.32) after the divorce and later time points. No significant changes over time could be observed, b_1 = 0.00, 95 % CI [–0.05, 0.05]. For these studies, the time lag between the event and the first time point did not account significantly for any differences among the effect sizes, b_2 = 0.05, 95 % CI [–0.07, 0.18]. The predicted adaptation curves for prospective and post-hoc designs are plotted in Figure 3.5.

Additional Moderator Analyses

Due to the low number of effect sizes, it was not possible to include any other moderator variables in the models. However, a descriptive inspection of the effect sizes in Figure 3.5 revealed that (a) all CWB effect sizes were in the positive range, and (b) the effect sizes for AWB varied considerably. For instance, the smallest effect size for post-hoc studies was *d* = –0.40 and the greatest effect size was *d* = 0.51. Both effect sizes were measured with the CES-D at 14 and 15 months after the event, respectively (see Table 3.13 in the Appendix).

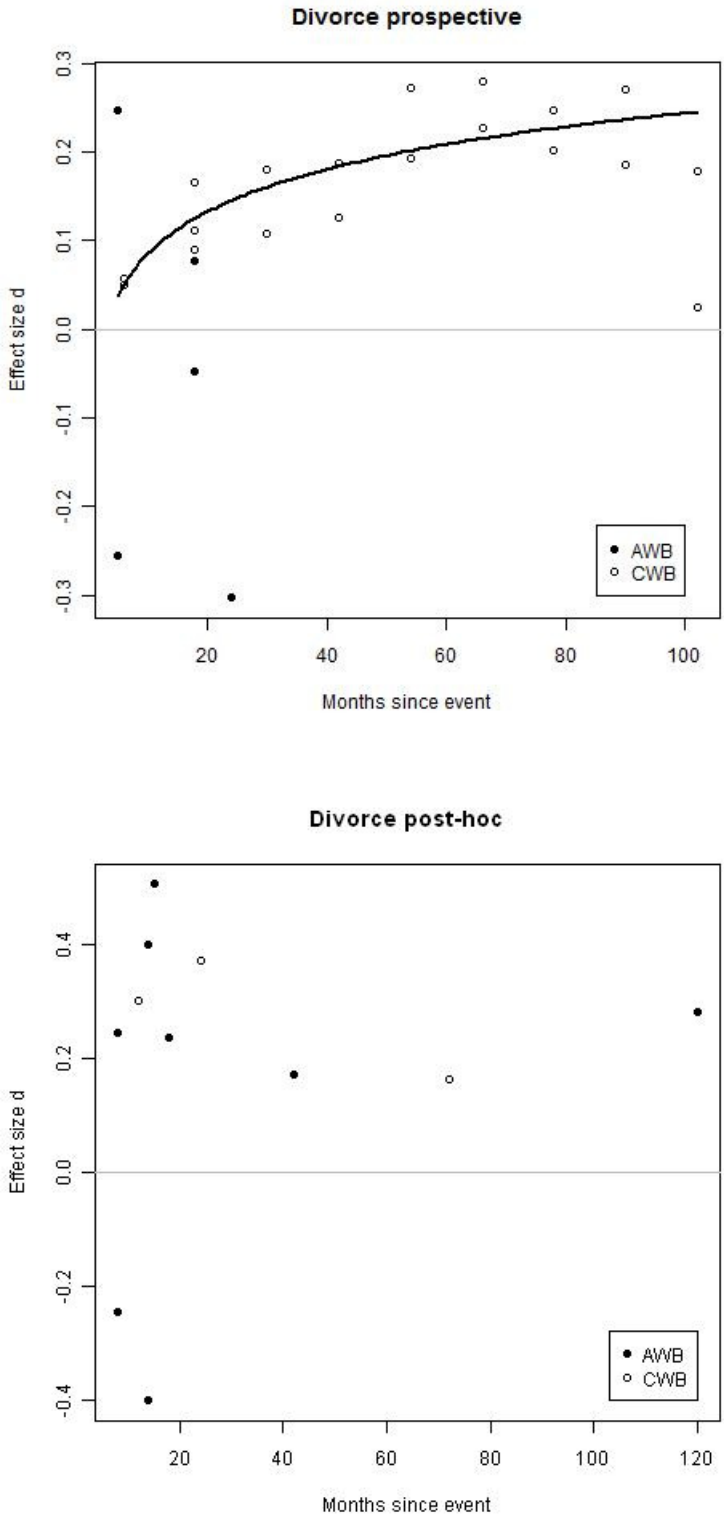


Figure 3.5. Observed effect sizes and predicted adaptation curve for divorce.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers. AWB = affective well-being, CWB = cognitive well-being.

Discussion

Divorce is typically seen as a thoroughly negative life event. Our findings indicate that the legal act of divorce itself (though not necessarily the whole process) might actually be beneficial for peoples' SWB: After getting divorced, SWB increases, compared to the year before the divorce. Similarly to marriage, this does not mean that divorced persons are generally happier than married persons. There are a number of reasons why SWB could be below its set point before the divorce: For instance, divorce marks the official end of a relationship, but the actual separation of course precedes this event. Even if the marital separation has not yet taken place at the time of the baseline assessment, SWB might be decreased because in most cases, the relationship is already going bad. Thus, adaptation might already have started before the divorce. Furthermore, divorce might be inherently positive at least for those persons who regard it as a relief from a bad marriage. In sum, our findings indicate that the reaction to divorce (as a distinct event) is, on average, positive, and people adapt to this event over time.

3.6.5 Bereavement

For bereavement, 21 independent prospective samples yielding 61 effect sizes and 27 independent post-hoc samples yielding 61 effect sizes were found. The average number of time points was 3.54 (*SD* = 2.34) for prospective and 3.03 (*SD* = 1.13) for post-hoc studies. The average percentage of males in these samples was the lowest of all events (23.8 %). This is not unexpected because in most Western countries, wives outlive their husbands more often than vice versa. The mean age of the samples was 55.04 years (*SD* = 14.69). AWB was the predominant outcome variable (79.6 %).

Initial Hedonic Reaction

The initial hedonic reaction to bereavement was negative but not significantly different from zero: The intercept of the Adaptation Model for the prospective studies (Table 3.4) was b_0 = –0.18, 95 % CI [–0.43, 0.07]. The average time lag between the baseline assessment before bereavement and the event itself was 6.69 months (*SD* = 4.75).

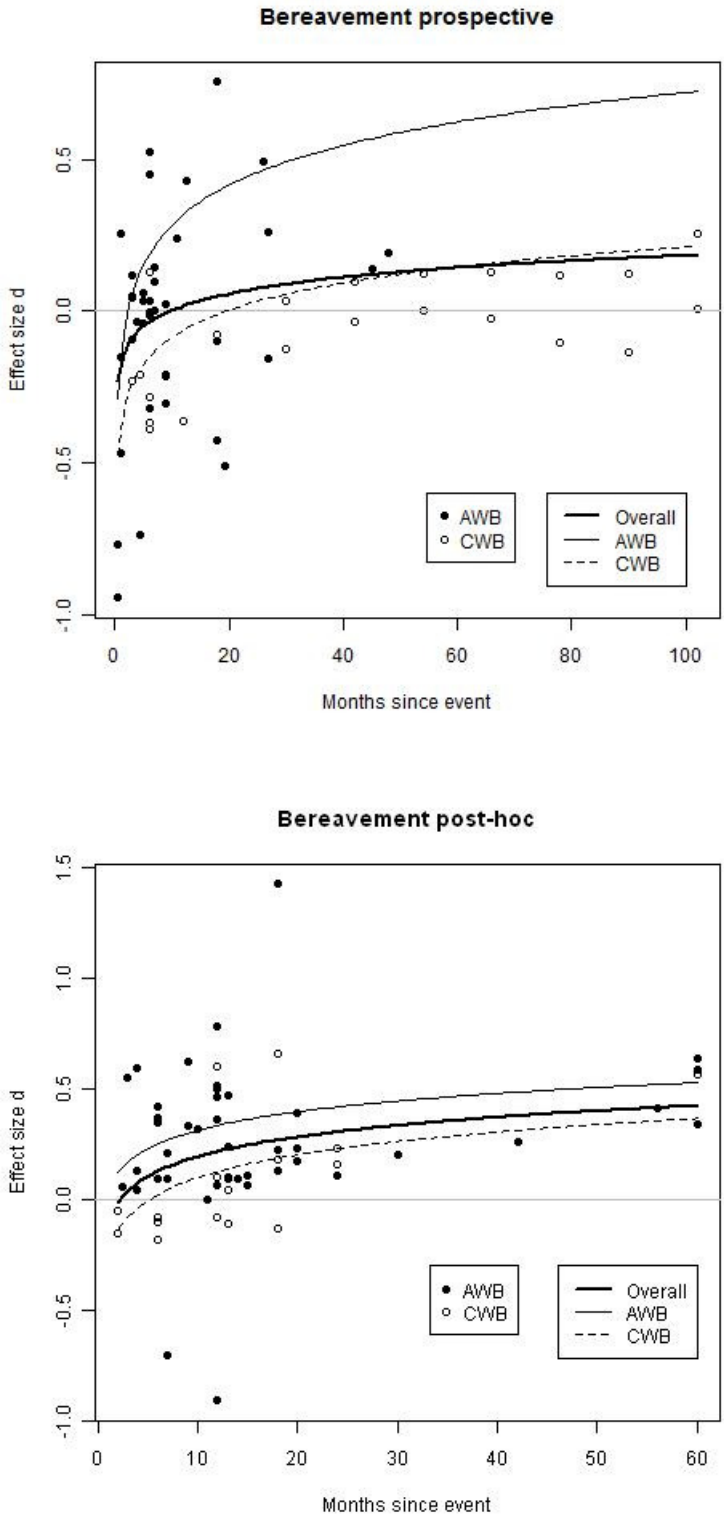


Figure 3.6. Observed effect sizes and predicted adaptation curves for bereavement.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers. AWB = affective well-being, CWB = cognitive well-being.

Adaptation

The trajectory of the prospective effect sizes was positive, b_1 = 0.08, 95 % CI [0.02, 0.14], indicating at least partial adaptation over time. The parameter of the time lag between baseline and event was not significantly different from zero, b_2 = 0.01, 95 % CI [–0.01, 0.04].

Post-hoc effect sizes reflect the mean-level difference between SWB shortly after the event (M = 3.25 months, SD = 2.63) and SWB at later time points. Similarly to the prospective effect sizes, these effect sizes also increase over time, b_1 = 0.13, 95 % CI [0.07, 0.19]. The parameter of the time lag between baseline and event was again not significantly different from zero, b_2 = –0.01, 95 % CI [–0.04, 0.02]. The predicted adaptation curves for prospective and post-hoc designs are plotted in Figure 3.6.

AWB vs. CWB

To test whether bereavement affects AWB and CWB differentially, dummy-coded AWB was included in the model. In both prospective and post-hoc studies, the effect sizes were more positive for AWB than for CWB, b_1 = 0.38, 95 % CI [0.19, 0.57] for prospective studies and b_1 = 0.22, 95 % CI [0.04, 0.39] for post-hoc studies, respectively (see first and third column of Table 3.5), suggesting that the impact of bereavement is worse on CWB than on AWB. When the interaction between AWB and time was added, the main effect of AWB was still positive for both designs, but significance was only reached for the post-hoc studies. For both prospective and post-hoc designs, the interaction parameter non-significant, indicating that the rate of adaptation was similar for both components.

Similarly to divorce, it was found that the effect sizes for AWB varied extremely. For instance, the most negative effect size for prospective studies was close to d = –0.94 at 0.5 months after the event, and one of the most positive effect sizes was d = 0.52 at 6 months after the event (see Table 3.14 in the Appendix for details). We will return to this finding in the general discussion.

Additional Moderator Analyses

No significant sex or age differences could be detected (Table 3.6), suggesting that the reaction and adaptation do not differ between men and women or between different age groups. For the prospective studies, the methodological moderators could not be tested due to the low number of effect sizes available for these tests. For the post-hoc studies, no significant effects of the methodological moderators were detected (Table 3.7).

Discussion

Bereavement is usually seen as one of the worst life events (Holmes & Rahe, 1967), followed by other relational events such as divorce. In our analyses, bereavement had a more negative initial impact on SWB than divorce, as can be seen when the intercepts of the respective Adaptation Models are com-

pared. However, the rate of adaptation was similar. Interestingly, we did not find any effects of percentage of males or average age in the samples. Although these moderators do not allow any strict tests of age or gender differences, they suggest that on average, bereavement has similar effects on males and females, young and old people alike. In sum, people adapt at least partially to bereavement, but the initial reaction is very negative, and adaptation takes a very long time.

3.6.6 Child Birth

Longitudinal studies on child birth are much more frequent than longitudinal studies on any of the other events included in our meta-analysis: 111 independent prospective samples yielding 267 effect sizes and 39 independent post-hoc samples yielding 84 effect sizes were found. The average number of time points was 2.77 (*SD* = 1.10) for prospective and 2.79 (*SD* = 1.04) for post-hoc studies. The samples were predominantly ad-hoc samples (93.3 %) and recruited specifically to study child birth as a life event (88.7 %). The average percentage of males in these samples was 30.6 %, the average reported mean age was 29.0 years (*SD* = 3.33).

Initial Hedonic Reaction

The initial hedonic reaction to child birth was not significantly different from zero, as indicated by the intercept of the Adaptation Model for the prospective studies (Table 3.4), b_0 = 0.02, 95 % CI [–0.07, 0.11]. This means that at the time of birth, SWB is similar to its level at, on average, 2.47 months before birth (*SD* = 2.30).

Adaptation

Neither prospective nor post-hoc effect sizes changed significantly over time. The respective change parameters were b_1 = –0.04, 95 % CI [–0.08, 0.00] for prospective studies and b_1 = –0.03, 95 % CI [–0.13, 0.06]. However, significant effects were found when AWB and CWB were examined separately (see below). The parameters of the time lag between baseline and event were not significant for prospective and post-hoc studies (Table 3.4). The average time lag between the first time point in the post-hoc studies and the event was 1.74 months (*SD* = 1.71). The predicted adaptation curves are plotted in Figure 3.7.

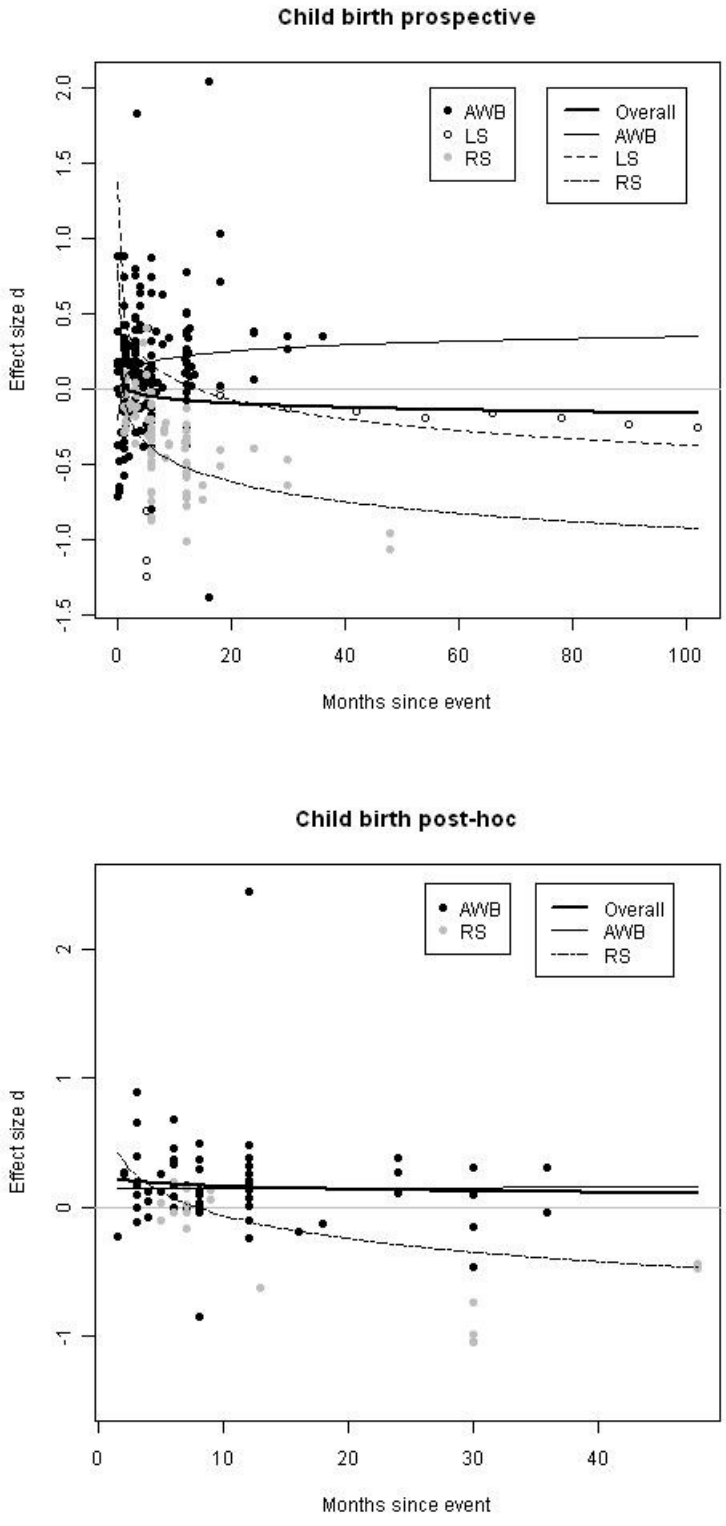


Figure 3.7. Observed effect sizes and predicted adaptation curves for child birth.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers. AWB = affective well-being, LS = life satisfaction, RS = relationship satisfaction.

AWB vs. CWB

Measures of life satisfaction, relationship satisfaction, and AWB were available for the prospective designs. To assess the differences between these components, dummy-coded AWB and dummy-coded relationship satisfaction as well as their interactions with time were included in the model (similarly to marriage, see above). At this point, only the results for the model that included all of these effects will be discussed (second column of Table 3.5).

The intercept shows that the initial reaction of life satisfaction was positive, b_0 = 0.50, 95 % CI [0.16, 0.85]. However, the slope was negative, b_1 = –0.19, 95 % CI [–0.28, –0.11] which indicates that life satisfaction decreases fast after the initial positive reaction has passed. The intercept of the relationship satisfaction curve was significantly less positive than the intercept for life satisfaction, b_4 = –0.55, 95 % CI [–0.87, –0.23]. The rate of adaptation did not differ between life satisfaction and relationship satisfaction, b_6 = 0.00, 95 % CI [–0.01, 0.01]. Thus, relationship satisfaction right after child birth is similar to its pre-birth level but then decreases over the subsequent months. Finally, the intercept for AWB was also less positive than the intercept for life satisfaction, b_3 = –0.43, 95 % CI [–0.78, –0.08]. The slope of the adaptation curve for AWB, however, as significantly less negative, compared to the slope for life satisfaction, b_5 = 0.25, 95 % CI [0.15, 0.43].

For post-hoc designs, no measures of life satisfaction were available. In this model, the parameter of time (last column in Table 3.5) reflects the change of relationship satisfaction over time, and the interaction parameter for dummy-coded AWB and time reflects how the trajectory of AWB differs from the trajectory of relationship satisfaction. Relationship satisfaction decreased over time, b_1 = –0.26, 95 % CI [–0.39, –0.13], whereas AWB stayed constant, b_5 = 0.26, 95 % CI [0.12, 0.40].

Together, these findings indicate that life satisfaction and relationship satisfaction decrease after child birth, whereas AWB is constantly above its pre-birth level.

Additional Moderator Analyses

The demographic moderators did not account for any variation in the prospective effect sizes (Table 3.6). In the post-hoc designs, negative interaction effects for the percentage of males with time and for age^2 with time were detected, suggesting that the decrease of SWB is faster for males and for people with higher- or lower-than-average age.

In both designs, effect sizes from studies that were conducted purposefully to study child birth were more negative (Table 3.7). Rate and cause of attrition accounted for some additional differences in the prospective effect sizes (second column in Table 3.7). Specifically, high attrition was associated with a more positive initial reaction and a steeper decrease. If the attrition rate was not systematically related

to SWB (no systematic drop-out), the initial reaction was significantly more positive and the decrease was significantly more negative in the prospective studies.

Discussion

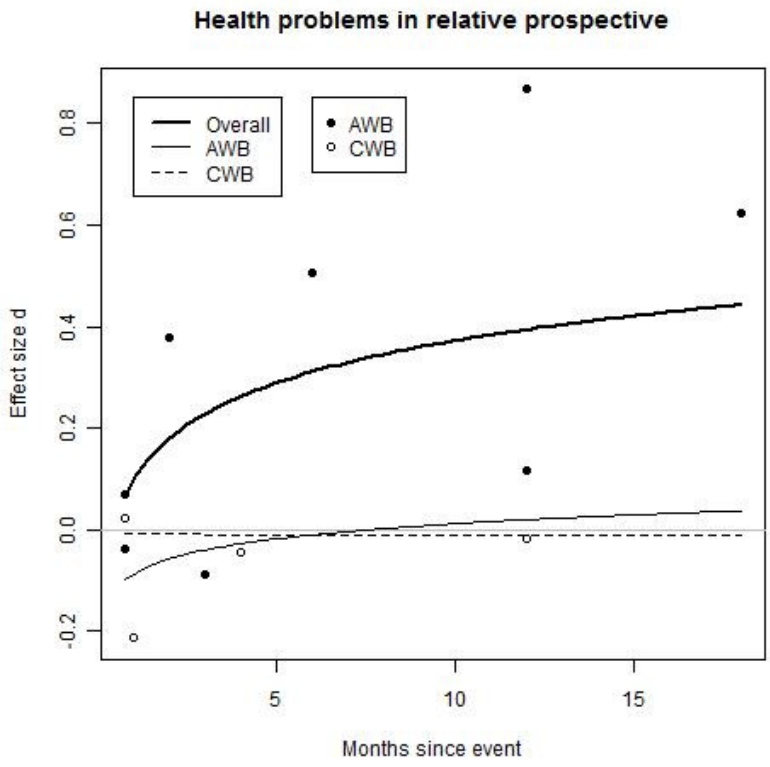
The birth of a child affects its parents' SWB in very diverse ways. Life satisfaction and relationship satisfaction tend to decrease after child birth. The effects are most pronounced for relationship satisfaction which decreases substantially in the first year after child birth. This downward trend is stopped after some years; however, the pre-birth baseline level of relationship satisfaction is not regained. This finding shows that the birth of a child is a serious challenge for couples. The effects of child birth on life satisfaction are also negative, but not quite as severe. Bottom-up theories of SWB (e. g., Schimmack, 2008) posit that global life satisfaction is an aggregate of satisfaction with various life domains. Against this background, our finding would suggest that the decreased relationship satisfaction has some negative effects on life satisfaction, but these effects are partially compensated by other life domains.

Despite these negative effects on the cognitive well-being of the parenting couple, the birth of a child is not a completely negative life event. The effects on AWB are small but clearly positive. Moreover, AWB stays constantly above the baseline level, which means that there is no adaptation.

3.6.7 Health Problems in Relative

This event category includes all events that are associated with a distinct health problem in the spouse or another close relative. To qualify as a life event according to our definition, these events must have a clear beginning. This is the case for health incidents such as heart attack, stroke, cancer diagnosis, or transition into care.[7] These events are likely to affect the spouse and other family members in significant ways. Six independent prospective samples yielding 12 effect sizes and 41 independent post-hoc samples yielding 75 effect sizes were found. The average number of time points was 2.50 (SD = 0.53) for prospective and 2.56 (SD = 0.62) for post-hoc studies. Most studies were published by medical researchers (76.9 %). All samples were ad-hoc samples. The average percentage of males in these samples was 38.1 %, the average reported mean age was 52.96 years (SD = 9.28).

[7] Of course, these events do also have a hedonic impact on the diagnosed person herself. However, in the present meta-analysis, we were only interested in the hedonic impact of these events on the spouse because for the diagnosed person, physical recovery and psychological adaptation are confounded.



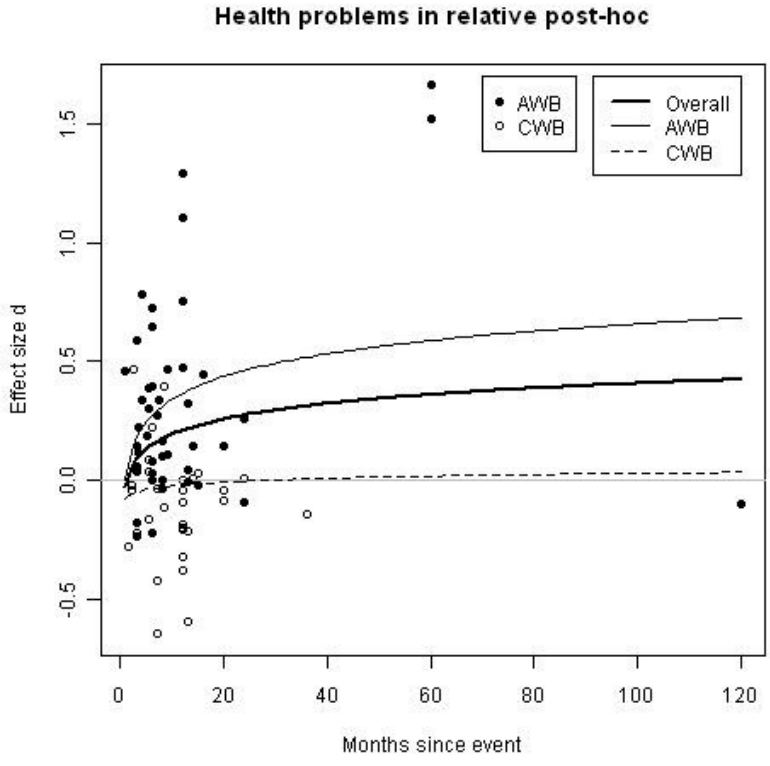


Figure 3.8. Observed effect sizes and predicted adaptation curves for health problems in relative.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers. AWB = affective well-being, CWB = cognitive well-being.

Initial Hedonic Reaction

The initial hedonic reaction to health problems of the relative was positive but not significantly different from zero, as indicated by the intercept of the Adaptation Model for the prospective studies (Table 3.4), b_0 = 0.10, 95 % CI [–0.01, 0.20]. This indicates that SWB after the event is somewhat more positive than SWB at, on average, 3.54 months (*SD* = 6.31) before the event.

Adaptation

For the prospective studies, the change parameter in the Adaptation model was positive, b_1 = 0.12, 95 % CI [0.06, 0.18]. With increasing time lag (more negative values on this variable), the effect sizes tended to be more positive, b_2 = 0.02, 95 % CI [0.01, 0.03], indicating that the effect sizes were most negative in those studies where the baseline was measured relatively shortly before the event.

Post-hoc effect sizes reflect the mean-level differences between SWB shortly after the event (*M* = 2.2 months, *SD* = 3.05) and SWB at later time points. The effect sizes tended to increase over time, but this effect was not significantly different from zero, b_1 = 0.09, 95 % CI [–0.08, 0.26]. The time lag between the baseline and the event did not account for any differences among the post-hoc effect sizes, b_2 = –0.03, 95 % CI [–0.08, 0.01]. The estimated adaptation curves for prospective and post-hoc designs are plotted in Figure 3.8.

AWB vs. CWB

By adding dummy-coded AWB to the models, differences in the initial hedonic reaction and the rate of adaptation can be examined. When only the main effect of AWB was considered (first column in Table 3.5), the intercept of the prospective studies was negative, b_0 = –0.08, 95 % CI [–0.11, –0.04], and the effect of AWB was positive, b_3 = 0.28, 95 % CI [0.18, 0.39]. These parameters show that the health incidences in close relative have a negative initial effect on CWB, but not on AWB. This effect was replicated in the post-hoc studies (third column in Table 3.5) where the effect of AWB was also positive, b_3 = 0.34, 95 % CI [0.16, 0.52].

When the interaction between AWB and time was added to the model for the prospective studies (second column in Table 3.5), the intercept of the AWB curve did not differ from the intercept for the CWB curve, as indicated by the non-significant parameter b_3. The interaction effect was positive, b_4 = 0.04, 95 % CI [0.03, 0.06], which means that AWB increases over time, but CWB does not, b_1 = 0.00, 95 % CI [–0.01, 0.01]. For the post-hoc studies, the interaction between AWB and time was also positive but not significant, b_4 = 0.12, 95 % CI [–0.06, 0.29].

Additional Moderator Analyses

Due to the small number of prospective effect sizes, no additional moderators could be tested for this design. For post-hoc studies, none of the demographic moderators explained any variance in the effect sizes (Table 3.6). Concerning the methodological moderators, a main effect was found for attrition rate (third column in Table 3.7), indicating that the effect sizes were more negative in studies with higher sample attrition.

Discussion

Most studies yielding data for this life event were post-hoc studies covering the first two years after the event. With these studies, it is not possible to determine whether SWB changes with respect to its pre-event level. However, it is possible to investigate whether any changes in SWB occur after the immediate "shock" has passed. Our analyses suggest that CWB stays constantly at the pre-event level, whereas positive effects were found for AWB. For AWB, this could mean that people adapt very fast to health changes in their relative and to the accompanied changes for themselves. By contrast, the findings on CWB might indicate that (a) CWB is not at all affected by health problems in the relative, which would require that the baseline level is identical to the (unknown) habitual set-point level, or (b) people evaluate their lives constantly worse, which would assume that CWB shortly before the event is below the set-point level due to anticipatory effects. As the set point is unknown, these alternative hypotheses cannot be tested in the present meta-analysis.

3.6.8 Unemployment

For unemployment, 17 independent prospective samples yielding 30 effect sizes and 4 independent post-hoc samples yielding 6 effect sizes were found. Due to the low number of post-hoc effect sizes, it was not possible to estimate the Adaptation Model. These effect sizes are depicted in Figure 3.9 but not further analyzed. Although unemployment has been studied extensively in cross-sectional studies (McKee-Ryan, Song, Wanberg, & Kinicki, 2005), only a few longitudinal studies assessing SWB were found. Compared to other studies in this meta-analysis, publications on unemployment were rather old (median publication year: 1995). Most of the data came from samples that were originally collected for other purposes. Only 19.1 % of the samples were recruited to study unemployment. The average number of time points was 2.58 (SD = 1.87) for prospective and 2.20 (SD = 0.45) for post-hoc studies. The average percentage of males in all samples was 41.5 %, mean age of the samples was 29.67 years (SD = 11.90).

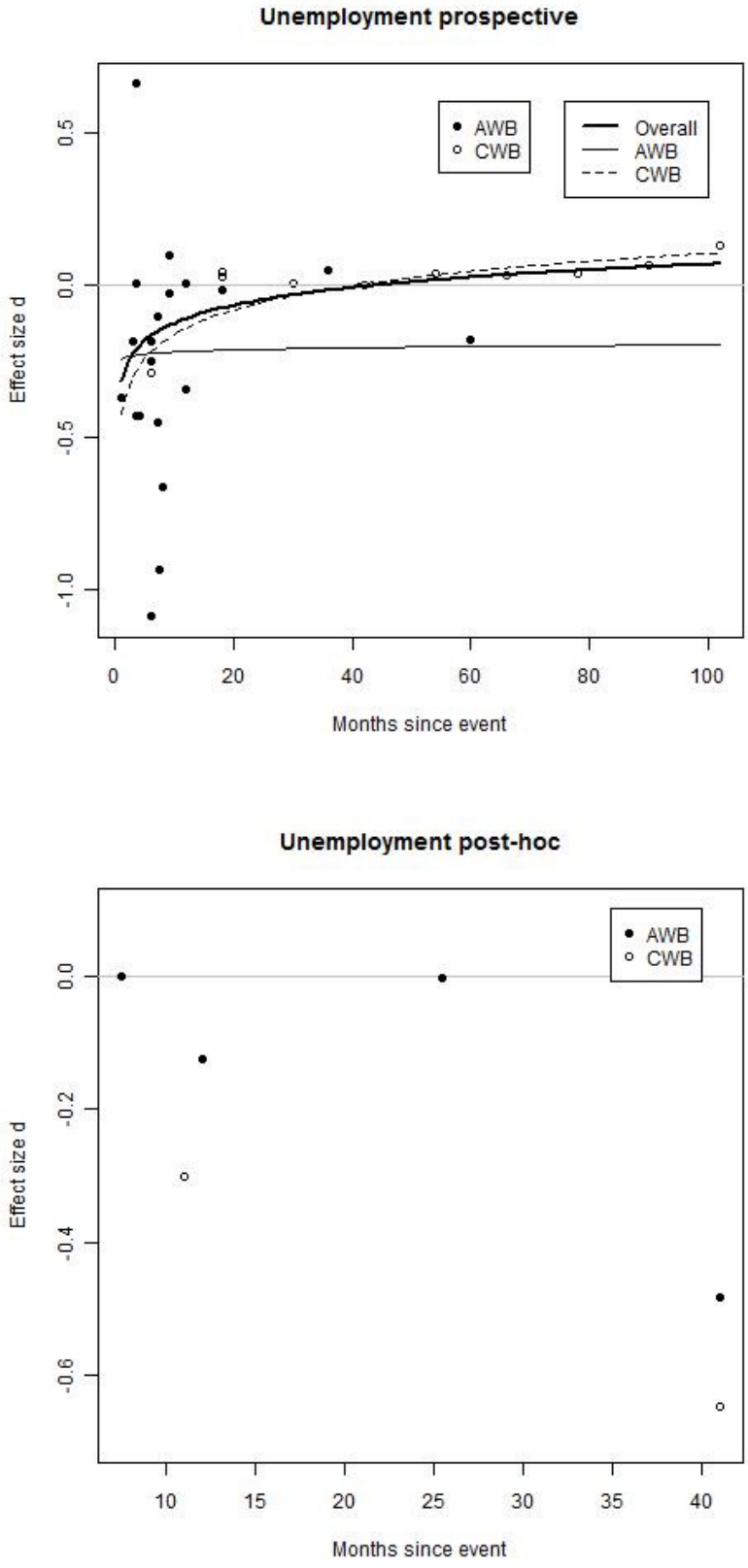


Figure 3.9. Observed effect sizes and predicted adaptation curves for unemployment.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers. AWB = affective well-being, CWB = cognitive well-being.

Initial Hedonic Reaction

The initial hedonic reaction to unemployment was negative, as indicated by the intercept of the Adaptation Model for the prospective studies (Table 3.4), b_0 = –0.32, 95 % CI [–0.57, –0.06]. This indicates that SWB right after the event is significantly lower than, on average, 6.92 months (*SD* = 5.16) before the event.

Adaptation

The trajectory of the prospective effect sizes over time was positive, b_1 = 0.08, 95 % CI [0.02, 0.15], suggesting that on average, people adapt at least partially to unemployment. However, when the estimated adaptation curve is plotted (Figure 3.9), it becomes apparent that the baseline level is only regained after more than 40 months. The time lag between baseline and event did not account for any differences among the effect sizes, b_2 = 0.00, 95 % CI [–0.01, 0.01].

Due to the small number of effect sizes, it was not possible to estimate the Adaptation Model for the post-hoc unemployment studies. However, a descriptive inspection of the effect sizes (Figure 3.9) shows that none of the effect sizes is positive. Compared to approximately one year after the onset of unemployment (*M* = 15 months, *SD* = 16.50), SWB becomes more negative. These patterns suggest that long-term unemployment is associated with decreasing SWB.

AWB vs. CWB

To analyze the differential effects of unemployment on AWB and CWB, dummy-coded AWB was added to the model for the prospective studies. At this point, only the findings for the complete model comprising main and interaction effects are discussed (second column in Table 3.5). The intercept of this model was negative, b_0 = –0.43, 95 % CI [–0.48, –0.38], whereas the main effect of AWB was positive but not significant, b_3 = 0.18, 95 % CI [–0.08, 0.45], which means that the initial hedonic reaction to unemployment is somewhat more negative for CWB than for AWB. Moreover, CWB and AWB differed significantly in the rate of adaptation: CWB increased somewhat over time, b_1 = 0.12, 95 % CI [0.10, 0.13]. The interaction parameter for AWB and time was negative, b_4 = –0.11, 95 % CI [–0.20, –0.01], indicating that AWB stays constantly below its baseline level. A graphical inspection of the effect sizes (Figure 3.9) shows that the effect sizes for CWB are relatively close to the pre-unemployment level, whereas the effect sizes for AWB vary extremely with a range of *d* = –1.09 to *d* = 0.66. This great variability in the AWB effect sizes has been observed before (e. g., for bereavement) and will be discussed in the general discussion below.

Additional Moderator Analyses

When only main effects of the demographic moderators were analyzed (first column in Table 3.6), significant effects were found for gender and age. Specifically, unemployment had more negative effects on SWB in samples with higher percentage of males and more positive effects on SWB in samples with higher mean age. These estimates suggest that the effect of unemployment is worst for young men. Adding interaction effects to the model rendered implausible values (e. g., the gender effect was –4.91); therefore, these results are not reported in Table 3.6.

The only methodological moderator that varied between the prospective studies was whether the data were collected to study unemployment. For this moderator, a negative interaction effect was found, indicating that adaptation to unemployment was slower in those samples that were recruited explicitly because they were unemployed (Table 3.7).

Discussion

Unemployment has differential effects on AWB and CWB (for similar recent findings, see Knabe et al., 2009). For AWB, the initial reaction was very diverse, ranging from strong negative to moderate positive effect sizes (see Figure 3.9). Over time, the effect sizes did not change significantly. For CWB, by contrast, a negative initial reaction and a positive logarithmic trajectory were found, suggesting that some adaptation occurs. Is this adaptation complete; that is, do people return to their initial set points? In most of the studies that were available for the present meta-analysis, the initial set point was unknown. However, two pieces of evidence suggest that adaptation is not complete: First, the predicted level of CWB was close to the baseline level, even many years after the onset of unemployment. This baseline level reflects the level of SWB some months before the event. It can be assumed that the baseline level is lower than the initial set point most people anticipate future unemployment some time beforehand (Clark et al., 2008). Second, the effect sizes in the post-hoc studies were, on average, negative (though it was not possible to estimate the Adaptation Model for these effect sizes), suggesting that *long*-term unemployment might even be associated with a sensitization effect. Thus, after some time, the initial adaptation process and the later sensitization process might cancel each other out which would explain why even after many years, SWB does not differ much from the pre-unemployment level. The effect of unemployment on SWB is worst for young men which might indicate that work is particularly important for this subgroup.

3.6.9 Reemployment

Reemployment describes the transition from a period of non-employment back into employment. Most of the reemployment studies were prospective: 15 independent samples yielded 27 effect sizes. Only one post-hoc sample with 2 effect sizes was found. These effect sizes were not further analyzed. The average number of time points in the prospective studies was 2.42 (*SD* = 0.84). The average percentage of males was 42.9 %, mean age was 28.93 years (*SD* = 9.43).

Initial Hedonic Reaction

The initial hedonic reaction to reemployment was not significantly different from zero, as indicated by the intercept of the Adaptation Model for the prospective studies (Table 3.4), b_0 = –0.04, 95 % CI [–0.22, 0.13]. The average time lag between baseline and reemployment was 6.24 months (*SD* = 4.10).

Adaptation

The change parameter was positive, b_1 = 0.06, 95 % CI [0.01, 0.11], indicating increasing SWB over time. The effect sizes were significantly more negative in studies where the time lag between baseline and event was small: If the time lag between baseline and event is decreased (indicated by increasing values on this variable), the expected effect size decreases by b_2 = –0.02, 95 % CI [–0.03, –0.01]. This finding suggests that reemployment might be anticipated before it actually occurs, and this anticipation is reflected in less positive effect sizes. The expected adaptation curve is plotted in Figure 3.10.

AWB vs. CWB

To examine differential effects of reemployment on AWB and CWB, the main effect of dummy-coded AWB and the interaction effect with time were added to the model (Table 3.5). At this point, only the results for the complete model with interaction effects will be reported (Table 3.5, second column). The intercept reflecting the initial hedonic reaction of CWB was negative, b_0 = –0.21, 95 % CI [–0.22, –0.19]. The change parameter for CWB was positive, b_1 = 0.09, 95 % CI [0.08, 0.10], which means that after an initial negative reaction, CWB increases over time. The trajectory for AWB was significantly different: The intercept was more positive than the intercept for CWB, b_3 = 0.28, 95 % CI [0.12, 0.45]. As this parameter reflects the difference between the intercepts, this means that the initial hedonic reaction for AWB was close to zero and neutral. The interaction effect was negative, b_4 = –0.05, 95 % CI [–0.10, –0.00], indicating that AWB does not increase at the same rate as CWB. In sum, these findings show that CWB decreases right after reemployment but increases again in the following months. By contrast, reemployment has no immediate effect on AWB, and almost no changes over time can be observed.

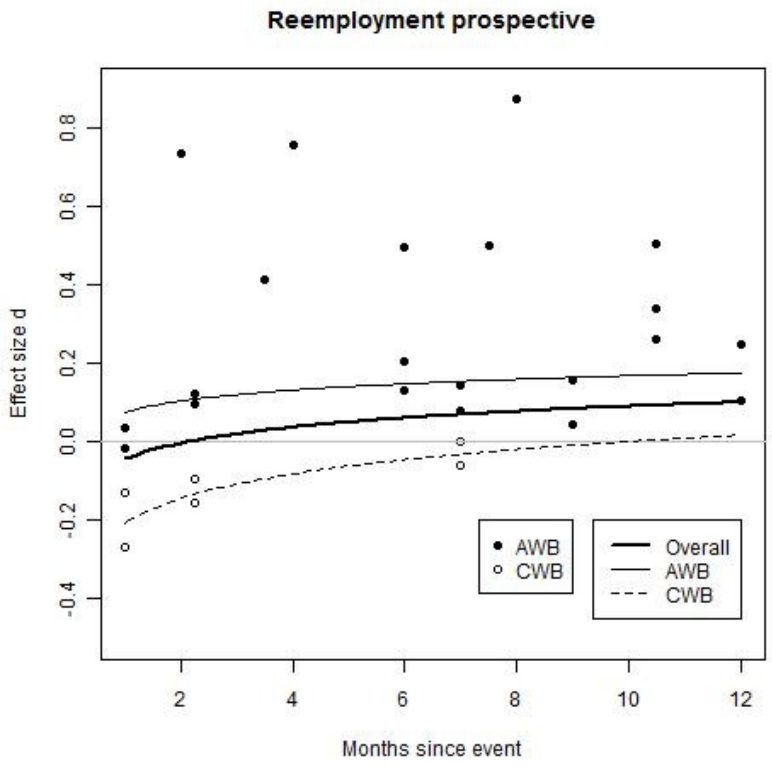


Figure 3.10. Observed effect sizes and predicted adaptation curves for reemployment.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers. AWB = affective well-being, CWB = cognitive well-being.

Additional Moderator Analyses

Reemployment had more positive effects on SWB in samples with higher percentage of males and higher mean age, indicating that older men benefit most from returning into employment (Table 3.6). Attrition rate and systematic drop-out were not available for these studies and could therefore not be examined as moderators (Table 3.7). Only one sample was recruited for a study on reemployment; therefore, this variable was also not tested as a moderator.

Discussion

In parallel to unemployment, reemployment has differential effects on CWB and AWB. AWB is not much affected by reemployment. By contrast, CWB is lower after reemployment compared to the baseline, and increases again over the following months. One explanation for this somewhat surprising finding is that reemployment might be anticipated, and this anticipatory effect affects the baseline assessment of CWB in a positive way. The actual impact of reemployment might be less positive than anticipated and therefore lead to a short-term decrease of SWB. The positive increase over time suggests that people adapt at least partially to this event.

The findings for the demographic moderators suggest that older males benefit most from being reemployed. This finding confirms the assumption inferred from the unemployment results that work is more central to men. The age effect could be interpreted as a relief effect: It is much harder for older persons to find reemployment than for younger persons, and if they succeed, they should be more satisfied about it.

3.6.10 Retirement

Most of the retirement studies were prospective: 14 independent samples yielded 38 effect sizes. Only one post-hoc sample with 3 effect sizes was found. These effect sizes were not further analyzed. The average number of time points in the prospective studies was 2.84 (*SD* = 1.21). Of all events examined in the present paper, retirement was the only where the samples were predominantly male. The average percentage of males was 65.9 %, mean age was 58.61 years (*SD* = 10.39).

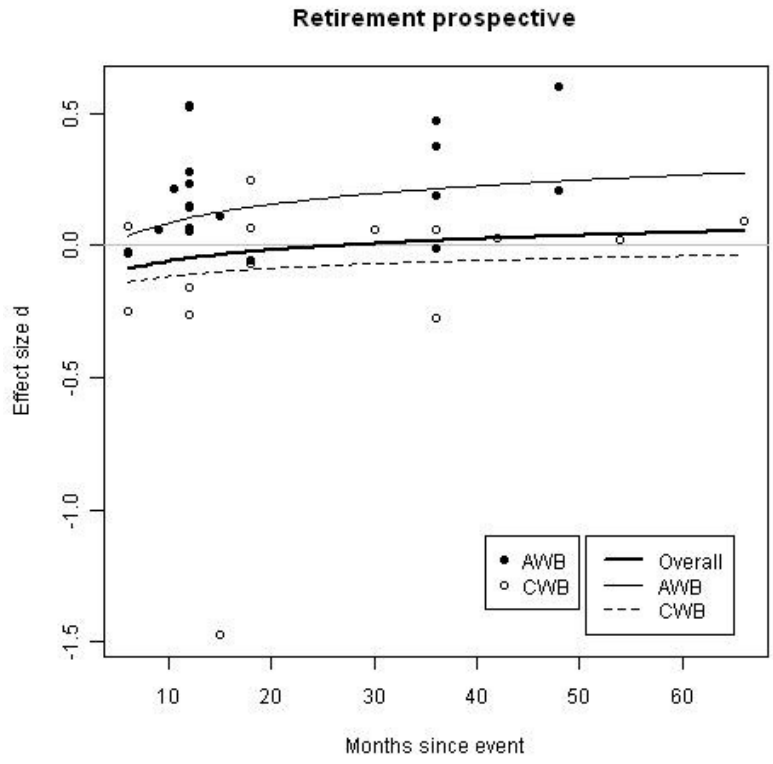


Figure 3.11. Observed effect sizes and predicted adaptation curves for retirement.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers. AWB = affective well-being, CWB = cognitive well-being.

Initial Hedonic Reaction

The initial hedonic reaction to retirement, indicated by the intercept of the Adaptation Model (Table 3.4), was negative but not significantly different from zero, b_0 = –0.20, 95 % CI [–0.49, 0.10]. The average time lag between baseline and retirement was 6.66 months (*SD* = 5.04).

Adaptation

The change parameter in the Adaptation Model was b_1 = 0.06, 95 % CI [–0.02, 0.14]; suggesting that on average, SWB stays rather constant after retirement. The time lag between baseline and event did not account for any differences between the effect sizes, b_2 = –0.02, 95 % CI [–0.04, 0.00]. The predicted adaptation curve is plotted in Figure 3.11.

AWB vs. CWB

When only dummy-coded AWB was included in the model (first column in Table 3.5), the intercept of this model was negative, b_0 = –0.29, 95 % CI [–0.54, –0.04], and the parameter for AWB was positive, b_3 = 0.24, 95 % CI –0.06, 0.41], indicating an initial negative reaction for CWB, but not for AWB. Moreover, the value of the change parameter was similar as in the Adaptation Model, but now reached statistical significance, b_1 = 0.07, 95 % CI [0.01, 0.13]. However, when the interaction between AWB with time was added to the model (second column in Table 3.5), none of the parameters was significant, possibly because of the rather low number of effect sizes.

Additional Moderator Analyses

The percentage of males in the sample did not account for any variance in the effect sizes (Table 3.6). By contrast, age could explain some of the differences: A positive effect of age² was found, indicating that higher- or lower-than-average age is associated with a more positive reaction to retirement. Due to the small number of effect sizes, it was not possible to examine interaction effects for the demographic moderators. Moreover, no tests of the methodological moderators could be conducted. In all of these cases, the analyses rendered improper solutions.

Discussion

Retirement is a typical example of a "neutral" event that comes with costs and benefits. On the one hand, most retirees are probably less stressed and have more time for family, friends, and non-professional activities. On the other hand, it is accompanied with reduced income, less structured days, less professional activities, and less social contacts. In addition, health problems are more likely in retirees simply because of their age, and in the case of early retirement, this event might be a direct consequence of reduced health. Our findings support the notion of retirement as a rather neutral event. The

initial hedonic reaction was close to zero, and only weak significant increases could be detected. The effects were somewhat more positive on AWB.

3.6.11 Other Occupational Transitions

This event category comprises various kinds of occupational transitions such as the transition from high school to college, or from college to the first job. These transitions are very normative, meaning that they happen to almost everyone. For prospective studies, 26 independent samples yielded 43 effect sizes. In addition, 8 independent post-hoc samples yielded 17 effect sizes. The average number of time points was 2.19 (*SD* = 0.62) for prospective and 2.42 (*SD* = 0.67) for post-hoc studies. Most of the samples were not recruited to study a specific event. Rather, these were typically studies where a generation of high school or college seniors was assessed while they were still at their institution, and again a couple of months after leaving it. The average percentage of males was 36.3 %, mean age was 23.62 years (*SD* = 8.24).

Initial Hedonic Reaction

Occupational transitions were associated with a neutral initial hedonic reaction. The intercept of the Adaptation Model for the prospective studies (Table 3.4) was b_0 = –0.01, 95 % CI [–0.16, 0.14]. The average time lag between baseline and event was 9.89 months (*SD* = 6.49).

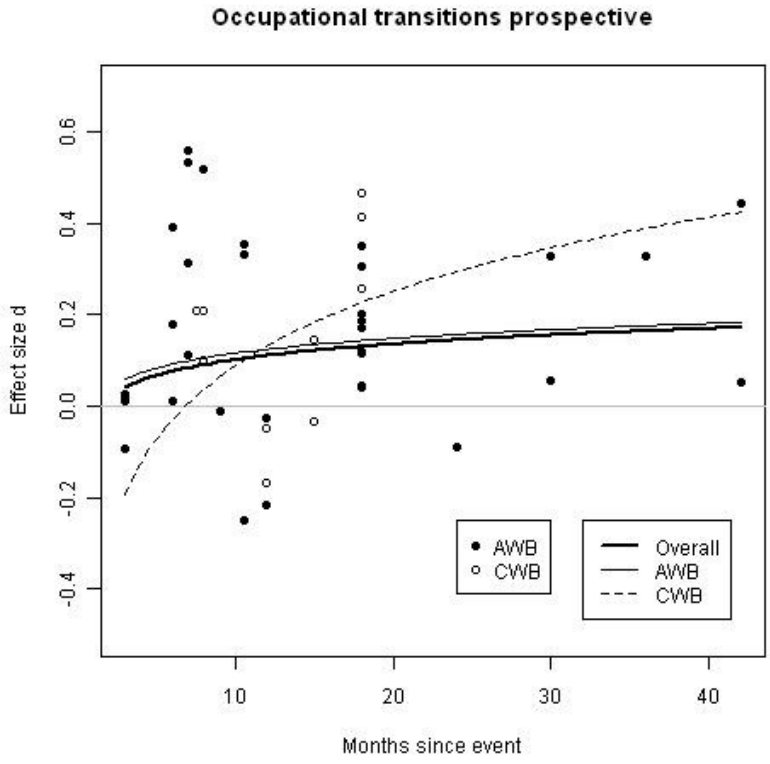
Adaptation

The trajectory of the prospective effect sizes was not significantly different from zero, b_1 = 0.05, 95 % CI [–0.03, 0.13]. The time lag between baseline and event did not account for any differences between the effect sizes, b_2 = 0.00, 95 % CI [–0.02, 0.01].

For the post-hoc effect sizes, the change parameter was significant and negative, b_1 = –0.26, 95 % CI [–0.39, –0.13]. This means that compared to shortly after the event (*M* = 2.09 months, *SD* = 3.33), SWB tends to decrease. A longer time lag between the event and the first measurement occasion was associated with less negative effect sizes, b_2 = 0.07, 95 % CI [0.02, 0.11] which means that the greatest changes occur in the first months after the event. The predicted adaptation curves for prospective and post-hoc designs are plotted in Figure 3.12.

AWB vs. CWB

No significant main or interaction effects of AWB were found for neither prospective nor post-hoc studies (Table 3.5). However, when the plot of the prospective studies (Figure 3.12) is expected more closely, it can be seen that CWB tends to increase faster than AWB.



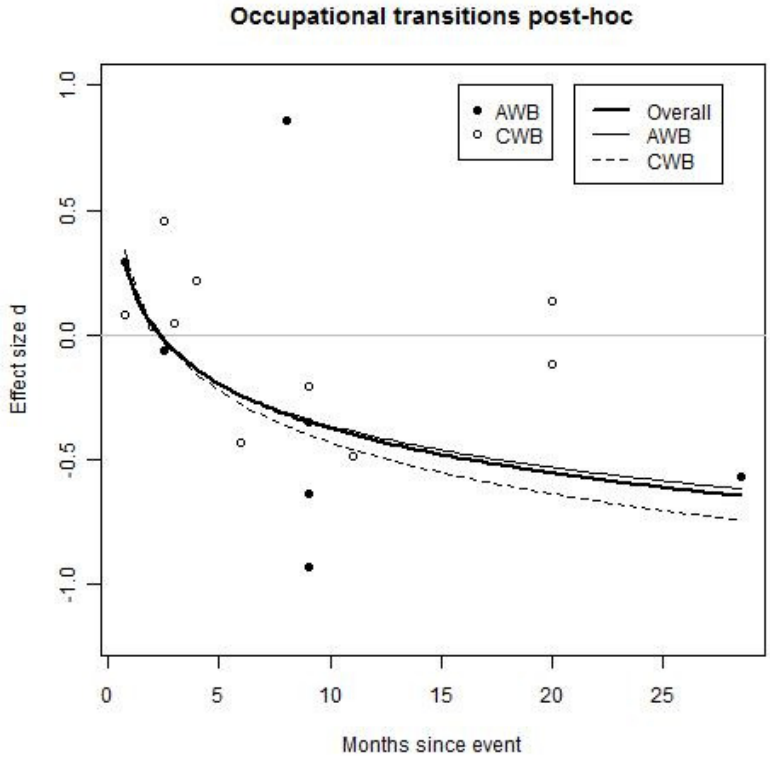


Figure 3.12. Observed effect sizes and predicted adaptation curves for other occupational transitions.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers. AWB = affective well-being, CWB = cognitive well-being.

Additional Moderator Analyses

The percentage of males in the sample was associated with more positive effect sizes, but this effect was only significant in a more complex model with interaction effects (Table 3.6). For age, an interesting pattern emerged when main effects of age and age² as well as interaction effects were included (second column in Table 3.6): Both the linear and the quadratic main effects were positive, and the interaction effects of the linear and quadratic terms with time were both negative. These findings suggest that older persons react more positively to these occupational transitions, but also adapt more quickly to them. It was not possible to test demographic moderators in the post-hoc studies because due to the low number of effect sizes, the model did not converge.

With respect to the methodological moderators, the absence of systematic drop-out was associated with more negative effect sizes in the prospective studies (Table 3.7). Moreover, the effect sizes were more negative when the samples were recruited explicitly because of this event. In the post-hoc studies, none of the tested methodological moderators reached statistical significance.

Discussion

Normative occupational transitions usually mark the beginning of a new life phase. Our results suggest that entering a new life phase has rather complex effects on SWB: After an initial negative reaction, SWB increases slightly (see prospective effect sizes) and then decreases again (see post-hoc effect sizes). We assume that the increase of SWB results in an overshoot effect (Solomon & Corbit, 1974) which means that for a short time, SWB is *above* its set-point level. Thus, we have two adaptation processes in effect here that can only be detected if prospective and post-hoc studies are considered separately: The first is upward adaptation to the stressors associated with this transition. The second is downward adaptation to a positive overshoot effect.

The moderating effects of age can be interpreted in two ways: First, it could indicate that normative events have more positive consequences if they occur later in life. This interpretation resembles the findings on marriage (see above). Second, the type of occupational transition and age are confounded here: The younger samples experienced the transition from high school to college or work whereas the older samples experienced the transition from college to work. Thus, it is possible that starting to work is a more positive event than starting college, for instance because it comes with a boost in income.

3.6.12 Relocation and Migration

Relocation and (voluntary) migration were analyzed together because both events are associated with moving from one place to another. Of course, migration is a more extreme case of relocation because it comes with a change of culture. We found 5 independent prospective samples yielding 10 effect sizes

for relocation and one prospective sample yielding 3 effect sizes for migration. All of the five post-hoc samples were migration samples. They yielded 10 effect sizes. The majority of the samples were ad-hoc samples (63.6 %) recruited explicitly to study relocation or migration (81.8 %). The average number of time points was 2.63 (*SD* = 0.92) for prospective and 3.00 (*SD* = 1.23) for post-hoc studies. The average percentage of males in these samples was 32.1 %, the mean age across all samples was 44.52 years (*SD* = 24.15).

Initial Hedonic Reaction

The initial hedonic reaction to relocation and migration was positive and statistically significant. The intercept of the Adaptation Model for prospective studies (Table 3.4) was b_0 = 0.24, 95 % CI [0.14, 0.23]. The average time lag between baseline and the event was 10.12 months (*SD* = 8.58).

Adaptation

For the prospective studies, the change parameter was b_1 = 0.05, 95 % CI [0.02, 0.09]. This result indicates that SWB increases further after the positive initial hedonic reaction to the event (see Figure 3.13). The parameter of the time lag between baseline and event was b_2 = 0.01, 95 % CI [0.00, 0.01] which means that the effect sizes are more positive for studies where the baseline is closer to the event, possibly because SWB is particularly low shortly before the event. The predicted adaptation curve is plotted in Figure 12.

Due to the small number of effect sizes, it was not possible to estimate the full Adaptation Model (or any of the subsequent moderator models) for the post-hoc studies. A descriptive inspection of the effect sizes (Figure 3.13) shows that most effect sizes are in the positive range, indicating that SWB is higher at later time points compared to relatively shortly after the event (*M* = 14.66 months, *SD* = 12.25).

Additional Moderator Analyses

For both prospective and post-hoc designs, the number of effect sizes was to low to examine demographic or methodological moderators.

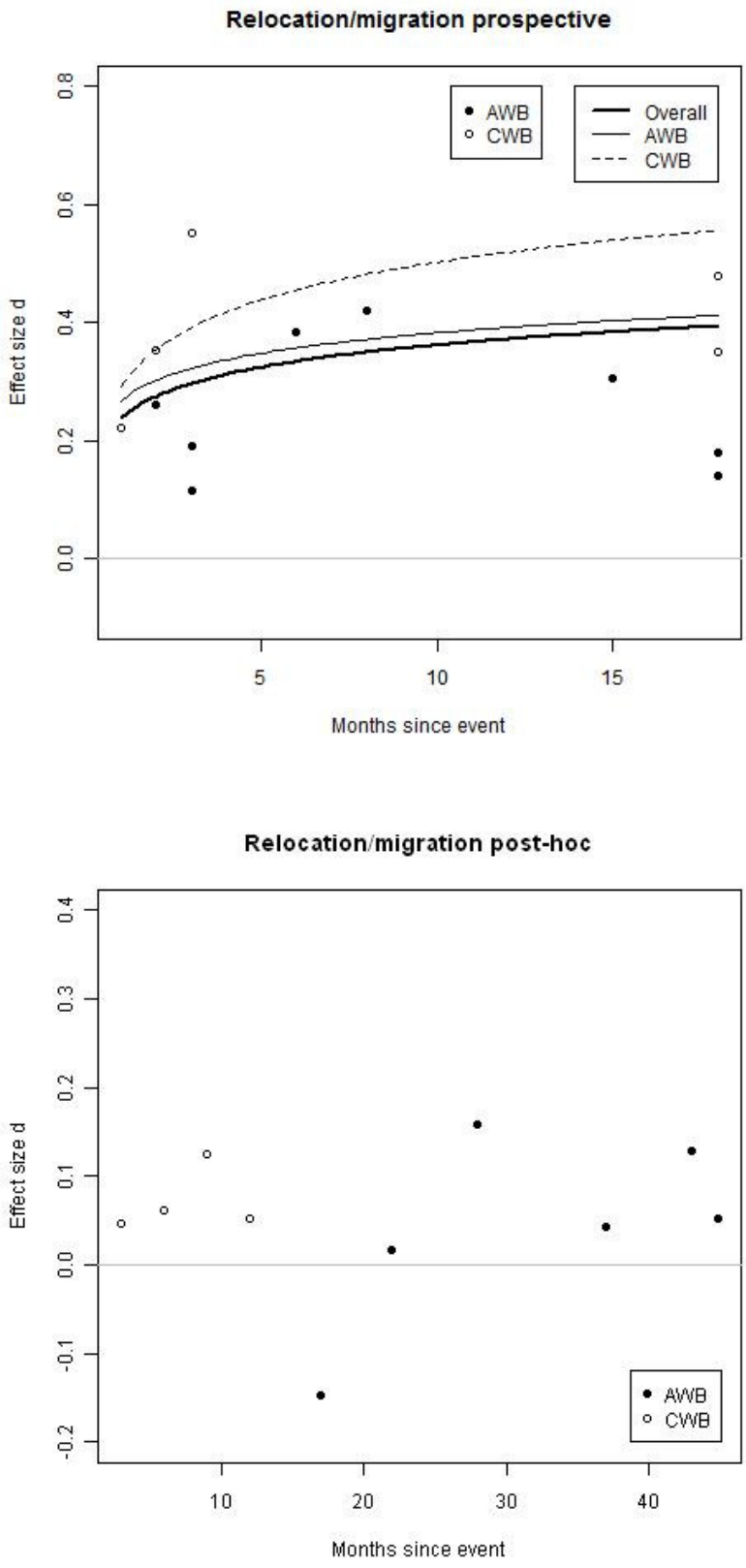


Figure 3.13. Observed effect sizes and predicted adaptation curves for relocation/migration.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers. AWB = affective well-being, CWB = cognitive well-being.

Discussion

Relocation and migration are stressful events that require people to adjust to new circumstances of their daily lives. Interestingly, their effects on SWB are rather positive: Overall, SWB is higher after the event than before the event. This effect can be explained in several ways: First, as everyone who has ever moved will admit, relocating is associated with a lot of work and stress that typically starts well before the actual moving date. Thus, the baseline assessments of SWB might be decreased because of this momentary stress. Second, in the months before relocating, people might overestimate the negative effects of relocation. And finally, the positive initial reaction could indicate that adaptation starts the moment the event has finally taken place.

3.6.13 Sensitivity Analyses

A series of sensitivity analyses were conducted in order to evaluate whether a number of disputable decisions affected the final estimates. In our case, these decisions concerned the replacement of missing correlation coefficients with plausible values, use of the clustering procedure in Mplus to account for statistically dependent effect sizes, and the bias correction of the effect sizes (see methods section). Table 3.8 reports estimates for four variants of the prospective Adaptation Model where (1) missing correlations were replaced with first quartile correlations (instead of median correlations), (2) missing correlations were replaced with third quartile correlations, (3) all effect sizes were treated as statistically independent, (4) the effect sizes were not corrected for sampling bias. As can be seen in Table 3.8, neither the estimates nor the confidence intervals differed substantially from the original results reported in the first column. These findings indicate that the decisions listed above did not affect the estimates of the meta-analytic model. The sensitivity analyses for post-hoc studies came to the same results.[8]

[8] The results of the sensitivity analyses on the post-hoc studies are not reported here but are available from the first author upon request.

Table 3.8. Results of the sensitivity analyses for the prospective Adaptation Model.

	Reported Model		**Low correlation**		**High correlation**		**No clustering**		**No bias correction**	
	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI
Marriage										
Intercept	-0.12	[-0.31, 0.06]	-0.12	[-0.31, 0.06]	-0.12	[-0.31, 0.07]	-0.12	[-0.34, 0.10]	-0.12	[-0.31, 0.07]
Months since event	-0.07	[-0.15, 0.00]	-0.07	[-0.15, 0.00]	-0.07	[-0.15, 0.00]	-0.07	[-0.14, -0.01]	-0.08	[-0.15, 0.00]
Lag baseline/event	-0.02	[-0.05, 0.01]	-0.02	[-0.05, 0.01]	-0.02	[-0.05, 0.01]	-0.02	[-0.04, -0.00]	-0.02	[-0.05, 0.01]
Divorce										
Intercept	-0.07	[-0.15, -0.00]	-0.08	[-0.15, -0.01]	-0.07	[-0.15, 0.01]	-0.07	[-0.13, -0.02]	-0.08	[-0.15, -0.00]
Months since event	0.07	[0.05, 0.09]	0.07	[0.05, 0.09]	0.07	[0.05, 0.09]	0.07	[0.05, 0.09]	0.07	[0.05, 0.09]
Lag baseline/event	0.00	[0.00, 0.01]	0.00	[0.00, 0.01]	0.00	[0.00, 0.01]	0.00	[-0.00, 0.01]	0.00	[0.00, 0.01]
Bereavement										
Intercept	-0.18	[-0.43, 0.07]	-0.17	[-0.42, 0.08]	-0.18	[-0.42, 0.07]	-0.18	[-0.38, 0.02]	-0.18	[-0.43, 0.07]
Months since event	0.08	[0.02, 0.14]	0.08	[0.02, 0.14]	0.08	[0.02, 0.14]	0.08	[0.02, 0.13]	0.08	[0.02, 0.14]
Lag baseline/event	0.01	[-0.01, 0.04]	0.01	[-0.01, 0.04]	0.01	[-0.01, 0.04]	0.01	[-0.01, 0.03]	0.01	[-0.01, 0.04]

	Reported Model		Low correlation		High correlation		No clustering		No bias correction	
	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI
Child birth										
Intercept	0.02	[-0.07, 0.11]	0.02	[-0.07, 0.11]	0.02	[-0.07, 0.11]	0.02	[-0.06, 0.10]	0.02	[-0.07, 0.11]
Months since event	-0.04	[-0.08, 0.00]	-0.04	[-0.08, 0.00]	-0.04	[-0.08, 0.00]	-0.04	[-0.08, -0.00]	-0.04	[-0.08, 0.00]
Lag baseline/event	0.00	[-0.02, 0.02]	0.00	[-0.02, 0.02]	0.00	[-0.02, 0.02]	0.00	[-0.02, 0.01]	0.00	[-0.02, 0.02]
Health problems relative										
Intercept	0.10	[-0.01, 0.20]	0.10	[-0.01, 0.21]	0.10	[-0.01, 0.20]	0.10	[0.01, 0.19]	0.10	[-0.01, 0.20]
Months since event	0.12	[0.06, 0.18]	0.12	[0.06, 0.18]	0.12	[0.06, 0.18]	0.12	[0.01, 0.23]	0.12	[0.06, 0.18]
Lag baseline/event	0.02	[0.01, 0.03]	0.02	[0.01, 0.03]	0.02	[0.01, 0.03]	0.02	[0.01, 0.03]	0.02	[0.01, 0.03]
Unemployment										
Intercept	-0.32	[-0.57, -0.06]	-0.32	[-0.57, -0.06]	-0.32	[-0.58, -0.06]	-0.32	[-0.57, -0.06]	-0.32	[-0.58, -0.07]
Months since event	0.08	[0.02, 0.15]	0.08	[0.02, 0.15]	0.08	[0.02, 0.15]	0.08	[0.02, 0.15]	0.09	[0.02, 0.15]
Lag baseline/event	0.00	[-0.01, 0.01]	0.00	[-0.01, 0.01]	0.00	[-0.01, 0.01]	0.00	[-0.01, 0.01]	0.00	[-0.01, 0.01]

	Reported Model		Low correlation		High correlation		No clustering		No bias correction	
	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI
Reemployment										
Intercept	-0.04	[-0.22, 0.13]	-0.04	[-0.21, 0.12]	-0.04	[-0.22, 0.14]	-0.04	[-0.18, 0.10]	-0.04	[-0.22, 0.14]
Months since event	0.06	[0.01, 0.11]	0.06	[0.01, 0.11]	0.06	[0.00, 0.11]	0.06	[-0.03, 0.15]	0.06	[0.00, 0.11]
Lag baseline/event	-0.02	[-0.03, -0.01]	-0.02	[-0.03, -0.01]	-0.02	[-0.03, -0.01]	-0.02	[-0.04, -0.00]	-0.02	[-0.03, -0.01]
Retirement										
Intercept	-0.20	[-0.49, 0.10]	-0.20	[-0.49, 0.10]	-0.20	[-0.49, 0.10]	-0.20	[-0.46, 0.07]	-0.20	[-0.49, 0.10]
Months since event	0.06	[-0.02, 0.14]	0.06	[-0.02, 0.14]	0.06	[-0.02, 0.14]	0.06	[-0.02, 0.14]	0.06	[-0.02, 0.14]
Lag baseline/event	-0.02	[-0.04, 0.00]	-0.02	[-0.04, 0.00]	-0.02	[-0.04, 0.00]	-0.02	[-0.04, -0.00]	-0.02	[-0.04, 0.00]
Other occupational transitions										
Intercept	-0.01	[-0.16, 0.14]	-0.01	[-0.16, 0.14]	-0.01	[-0.16, 0.14]	-0.01	[-0.17, 0.15]	-0.01	[-0.16, 0.14]
Months since event	0.05	[-0.03, 0.13]	0.05	[-0.03, 0.13]	0.05	[-0.03, 0.13]	0.05	[-0.02, 0.12]	0.05	[-0.03, 0.13]
Lag baseline/event	0.00	[-0.02, 0.01]	0.00	[-0.02, 0.01]	0.00	[-0.02, 0.01]	0.00	[-0.01, 0.01]	0.00	[-0.02, 0.01]

	Reported Model		Low correlation		High correlation		No clustering		No bias correction	
	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI	Estimate	95 % CI
Relocation/migration										
Intercept	0.24	[0.14, 0.33]	0.24	[0.14, 0.33]	0.24	[0.14, 0.33]	0.24	[0.16, 0.32]	0.24	[0.15, 0.34]
Months since event	0.05	[0.02, 0.09]	0.05	[0.02, 0.09]	0.05	[0.02, 0.09]	0.05	[0.01, 0.10]	0.05	[0.02, 0.08]
Lag baseline/event	0.01	[0.00, 0.01]	0.01	[0.00, 0.01]	0.01	[0.00, 0.01]	0.01	[-0.01, 0.02]	0.01	[0.00, 0.01]

Notes. Low correlations = missing correlation coefficients were replaced by the 1st quartile correlation. High correlations = missing correlation coefficients were replaced by the 3rd quartile correlation. No clustering = The statistical dependency between effect sizes from the same samples was ignored. No bias correction = The effect sizes were not corrected for sampling bias.

3.7 General Discussion

According to the classic adaptation hypothesis, people adapt to any life event within a matter of months. In the present paper, this hypothesis was tested meta-analytically for ten family- and work-related events. Because the habitual set-point level was unknown in most of the studies, it was not possible to determine whether adaptation was completed (as indicated by a return to the set point). However, the analyses delivered valuable information about trajectory of SWB after life events. These trajectories reflect whether adaptation (that is, a tendency to return to the baseline) occurs at all.

The central findings were: (1) People adapt at least partially to most of the events that were examined in this meta-analysis. Although most of the adaptation occurs during the first year after the event, significant changes in SWB can be observed over very long time spans, suggesting that adaptation takes much longer than previously assumed (e. g. by Suh et al., 1996). (2) The direction and the magnitude of the initial hedonic reaction as well as the rate of adaptation varied substantively between different life events. (3) Life events affect AWB and CWB differentially. Specifically, AWB was more positive than CWB after most events. In the next sections, we will discuss these findings in more detail.

3.7.1 Reaction and Adaptation to Major Life Events

To summarize the central findings, the predicted prospective trajectories for global SWB are depicted in Figure 3.14. For the following interpretation, we will focus on two features of these trajectories: (1) Does the curve start above or below baseline level? This question refers to the initial hedonic reaction to the event (Research Question 1): A positive intercept indicates an increase of SWB, compared to its level shortly before the event. A negative intercept indicates a decrease of SWB, compared to its level shortly before the event. (2) What is the shape of the trajectory? This question concerns the rate of adaptation or sensitization to the event (Research Question 2). Apart from the shape of the trajectory, it is also interesting to examine whether and when the adaptation curves cross the baseline level which indicates that the pre-event level of SWB is reached.

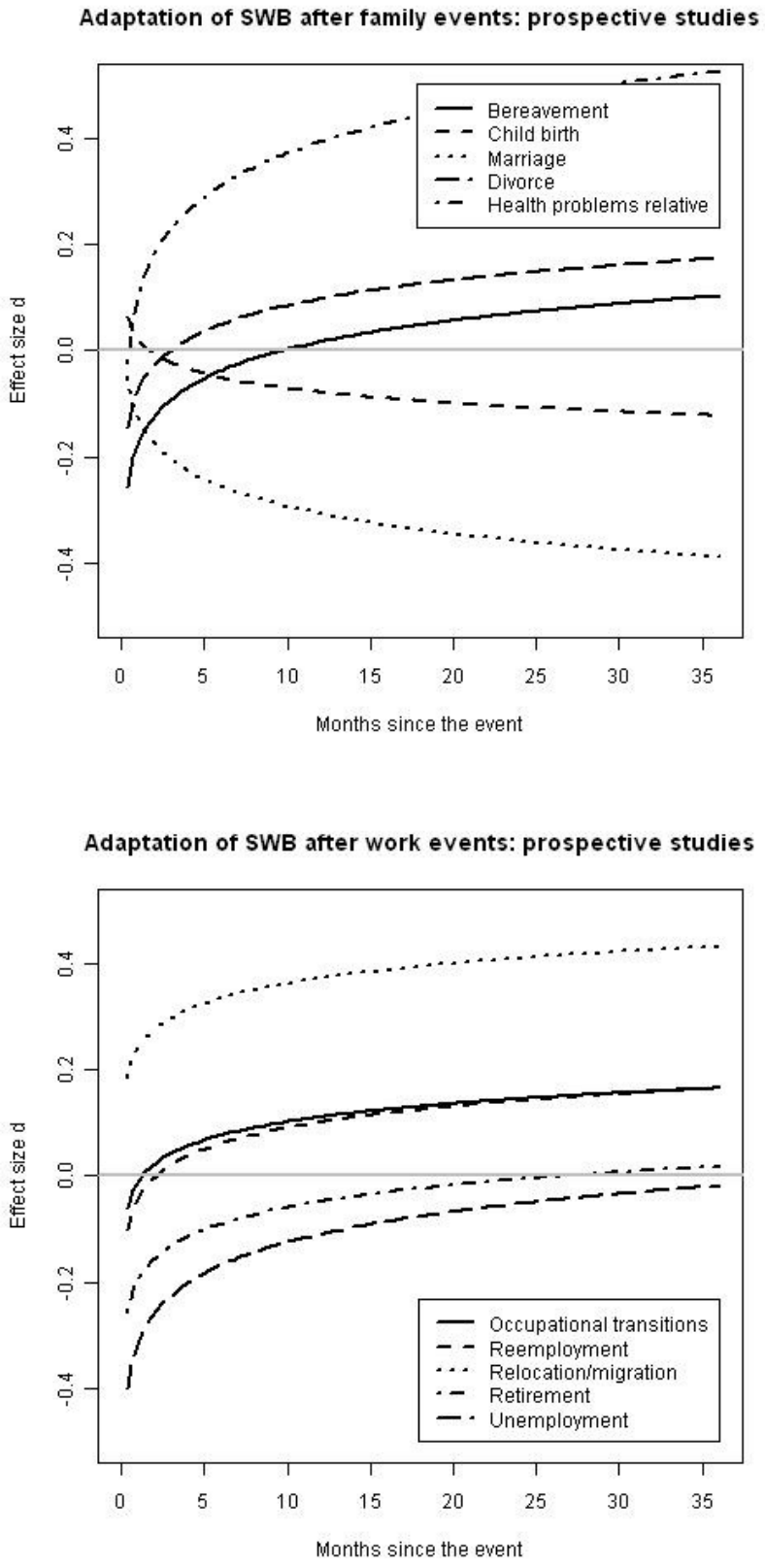


Figure 3.14. Predicted prospective adaptation curves for SWB.

The time lag between the baseline and the event is held constant at zero months. The predicted adaptation curves are based on all available effect sizes, including outliers.

Most family events were associated with a neutral or negative average initial hedonic reaction, except for child birth where the initial hedonic reaction was in the positive range. For marriage and child birth, SWB decreased in the following months. By contrast, bereavement, divorce, and health problems of a relative were associated with increasing SWB. As indicated by the parallel curves in Figure 3.14, the rate of adaptation was similar for divorce and bereavement, but the curves differed with respect to when they reached the baseline level: For divorce, the baseline was reached at 4 months, for bereavement, it took approximately 6 months longer. This does not mean that adaptation is complete after that time because the baseline level is not necessarily identical to the set point. Indeed, SWB continues to increase after return to the baseline.

For work events, the average initial hedonic reaction was positive for relocation/migration and negative for the other events. The most negative reactions were associated with unemployment and retirement. For all work events, SWB increased over time, however, there were considerable differences with respect to when the baseline level was reached. For relocation and migration, for instance, SWB after the event was constantly above its pre-event level. For reemployment and other occupational transitions, the baseline level was regained within the first three months after the event. Very different patterns were found for retirement and unemployment. Although SWB tended to increase after these events, the baseline level was not reached for several years. The effect is particularly striking for unemployment, which was not unexpected in the light of previous studies that indicated that unemployment can "scar" people (Clark, Georgellis, & Sanfey, 2001) over many years (also Lucas et al., 2004; Luhmann & Eid, 2009).

3.7.2 Affective vs. Cognitive Well-Being

Almost all of the life events in this meta-analysis affected AWB and CWB differentially. The variance of the effect sizes was often much greater for AWB than for CWB (e. g., bereavement, health problems in relative, unemployment), even if similar time points were considered. Furthermore, the initial hedonic reaction was typically more negative for CWB (see Figure 3.4 through Figure 3.13). Finally, the adaptation curves were often flatter for AWB than for CWB (e. g., marriage, child birth, occupational transitions, relocation/migration), indicating that the level of CWB is much more affected by how much time has passed since the event. Thus, our assumption that adaptation is faster for AWB than for CWB was confirmed for most events. For child birth and marriage, CWB was further divided into life satisfaction and relationship satisfaction. Again, these components were differentially affected by the event: Both child birth and marriage had more negative effects on relationship satisfaction than on overall life satisfaction.

These findings support an important assumption of the revised set-point theory (Diener et al., 2006). The authors proposed that each component of SWB has its own set point and can change differentially over time. People can evaluate their lives more negatively and feel better at the same time, compared to before the event. Moreover, their CWB can decrease while their AWB stays constant (for instance, after marriage). The existence of multiple set points has important implications for future research: It must now be examined whether the assumptions of set-point theory hold for all components of SWB alike. For instance, future studies need to determine why external circumstances can have different short-term and long-term effects on SWB. One possible explanation is that CWB adaptation and AWB adaptation serve different functions that require slower or faster adaptation. Another avenue for future research concerns the effects of various moderator variables on individual differences in adaptation. It has been proposed that personality (particularly neuroticism), coping strategies, mood regulation, or social support might predict how individuals react and adapt to specific events (Diener et al., 2006). It is quite possible that, for instance, mood regulation only explains individual differences in AWB adaptation whereas neuroticism might explain individual differences in both AWB and CWB. Considering moderators of individual differences might also explain why the range of AWB effect sizes was so much larger than the range of CWB effect sizes. This variability of AWB effect sizes might indicate that AWB is more influenced by these moderators than CWB. Alternatively, however, this variability might also have methodological causes, for instance, the use of different instructions in the scales. In future studies, SWB researchers should strive to identify the most important psychological and methodological moderators of individual differences, describe their differential effects on AWB and CWB, and explain the mechanisms that account for these differences.

Finally, the existence of multiple set points has implications for interventions that aim at accelerating or decelerating the process of adaptation. As AWB and CWB differ in their responsiveness to life events (and possibly, other external circumstances), different interventions might be necessary to influence these components (Larsen & Prizmic, 2008). In this case, two additional questions need to be answered. The first is a scientific one: Which interventions are effective to increase AWB and CWB, respectively? We think that individual interventions that change people's activities (Lyubomirsky, Sheldon, & Schkade, 2005) could be more relevant for AWB, whereas public policy interventions that focus on changing people's life circumstances could be more relevant for CWB. The second question has a normative dimension: What is more important, increasing AWB or increasing CWB? This is a philosophical problem that can turn into a political issue as soon as public policy interventions are affected. But in the end, everybody probably has to decide this for himself.

3.7.3 Limitations

The validity of meta-analytical results is always influenced by the quality of the included studies. At this point, it is necessary to discuss some limitations and provide directions and recommendations for future research. Most of them are related to the designs of the studies that were included in our meta-analysis.

A first limitation of these studies is that the set point of SWB was unknown. On average, the baseline assessment in prospective studies took place approximately five months before the event. The baseline level might differ from the set-point level because of anticipatory effects (Clark et al., 2008). Thus, it is not possible to determine whether and when adaptation is completed (as indicated by a return to the set point). To avoid this ambiguity, the first time point in future adaptation studies should be early enough so that no anticipation effects can occur. At best, multiple measurements before the event should be taken so that the trajectory of the anticipatory effects can be analyzed. This is of course very difficult to achieve in practice, particularly for rare events such as bereavement. One way to deal with this problem is to use archival datasets such as the SOEP or the BHPS. But these datasets have their limitations as well. For instance, they lack a number of psychological moderator variables that might be of interest for the researcher. At the very minimum, researchers should try to control for these anticipatory effects by asking participants directly whether they had anticipated the event, complemented by retrospective measurements of pre-event SWB.

The second limitation applies to almost all longitudinal studies: The external validity of the results is threatened by systematic drop-out. To evaluate whether this affected our meta-analytic results, we examined systematic drop-out (which was rarely reported) and the attrition rate itself as methodological moderators. The results were inconsistent and, as far as we could judge, unsystematic across and even within events: For instance, high attrition was associated with positive effect sizes in prospective marriage studies and negative effect sizes in post-hoc marriage studies. Similarly, samples that were collected to study the specific life events sometimes provided different effect sizes than samples that were collected for purposes not related to the life event. However, the effects were again inconsistent across the event. We can therefore only conclude that these factors can distort the findings, but not in which direction. For future studies, we recommend to examine the reasons for drop-out and whether these persons differ systematically from those participants who stayed in the study.

Third, our analyses were restricted to ten specific family- and work related events. For many other interesting life events, the number of longitudinal studies was simply too low to include them in the meta-analysis. For instance, cosmetic surgery is sometimes named as the only positive event people do *not* adapt to (Fredrick & Loewenstein, 1999). Are less wrinkles and bigger breasts really the way to happiness? We would have liked to examine this in the present meta-analysis, but no longitudinal studies

were available. Clearly, more longitudinal research on less conventional events is needed. In addition, our descriptive findings revealed trends for research on specific life events. For instance, the longitudinal studies on unemployment were comparatively old, whereas the longitudinal studies on divorce were published recently. Does this mean that we already know everything about unemployment? Certainly not, as indicated by the low number of longitudinal studies that studied the impact of this event on SWB. Thus, even for the events included in this meta-analysis, more longitudinal studies are required.

Finally, it is illuminative to point out a number of methodological gaps in previous adaptation studies. In most studies (97.9 %), SWB was assessed via self-reports. Self-reports are the gold standard to assess SWB, but data from other sources (e. g. peer reports) might nonetheless deliver interesting insights into the stability and variability of SWB in the context of life events. We strongly believe that multimethod approaches to SWB could stimulate research on adaptation to life events (Eid & Diener, 2006). Related to this is the rare use of experience sampling studies in this field (Hektner, J. A. Schmidt, & Csikszentmihalyi, 2007; Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004). Experience sampling would allow a real-time examination of the changes in SWB right after an event has occurred.

3.7.4 Recommendations for Future Research

We would like to conclude this paper with some general recommendations for future studies on adaptation.

1. Adaptation can only be studied adequately in longitudinal studies. These studies should consist of multiple measurements, not only after the event, but, if possible, also before the event.
2. The intervals between the measurements must be chosen with respect to the predicted rate of adaptation: As can be seen in our findings, the trajectories of SWB after the event can often be described with a logarithmic function. A logarithmic-change model can best be estimated if the intervals between measurements are shorter right after the event and longer towards the end of the study.
3. Researchers should always examine several components of SWB. This may include measures of positive and negative affect (AWB) as well as measures of global life satisfaction and more specific domain satisfaction (CWB).
4. Multimethod measurement of SWB is very rare to date, and future studies should attempt to close this gap by considering methods such as peer reports or psychophysiological measures in addition to self-reports.
5. Because we believe that identifying the sources of individual differences in adaptation is a major research goal for the next years, potential moderator variables should always be examined, including

psychological moderators (e. g., personality), demographic moderators (e. g., gender), and methodological moderators (e. g., specific scales).

With more studies that are designed according to these recommendations, it will eventually be possible to gain a full understanding of the mechanisms, functions, and boundary conditions of adaptation.

3.8 References

References marked with an asterisk (*) indicate studies that were included in the meta-analysis. References marked with a cross (†) indicate scales that were used to measure SWB.

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3.9 Appendix to Chapter 3

Table 3.9. Abbreviations for the most common scales used in the meta-analysis.

Abbreviation	Name of Scale	Reference
ABS	Affect Balance	Bradburn, 1969
BSI	Brief Symptom Inventory	Derogatis, 1983
CES-D	Center for Epidemiological Studies Depression Index	Radloff, 1977
DACL	Depressive Adjective Checklist	Lubin, 1965
DAS	Dyadic Adjustment Scale	Spanier, 1976
EPDS	Edinburgh Postnatal Depression Scale	Cox, Holden & Sagovsky, 1987
GHQ	General Health Questionnaire	Goldberg, 1992
GWB	General Well-Being Scale	Dupuy, 1973
HADS	Hospital anxiety and depression scale	Zigmond & Snaith, 1983
HSC	Hopkins Symptoms Checklist	Derogatis,Lipman, Rickels, Uhlenhuth & Covi, 1974
KMS	Kansas Marital Satisfaction Scale	Schumm, Paff-Bergen, Hatch & Obiorah, 1986
MAT	Marital Adjustment Test	Locke & Wallace, 1959
MHI	Mental Health Inventory	Veit & Ware, 1983
MOQ	Marital Opinion Questionnaire	Huston et al., 1986
PANAS	Positive Affect Negative Affect Schedule	Watson, Clark, & Tellegen, 1988
POMS	Profile of mood states	McNair, Lorr, & Droppelman, 1971
QMI	Quality of Marriage Index	Norton, 1983
SCL-90	Symptom Checklist-90	Derogatis, 1977
SF-36	Short Form Health Survey (SF-36)	Ware & Sherbourne, 1992
SMD	Semantic Differential	Osgood, Suci, & Tannenbaum, 1957
SWLS	Satisfaction With Life Scale	Diener, Emmons, Larsen, & Griffin, 1985

Table 3.10. Prospective effect sizes for marriage.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	6	1114	0.06
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	18	924	-0.01
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	30	763	-0.03
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	42	635	-0.08
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	54	502	-0.08
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	66	434	-0.12
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	78	342	-0.19
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	90	258	-0.18
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	102	170	-0.13
Beach & O'Leary (1993)	husbands	CWB	MAT	-1	6	241	-0.21
Beach & O'Leary (1993)	husbands	CWB	MAT	-1	18	241	-0.28
Beach & O'Leary (1993)	wives	CWB	MAT	-1	6	241	-0.17
Beach & O'Leary (1993)	wives	CWB	MAT	-1	18	241	-0.30
Crowell, Treboux & Brockmeyer (2009)		CWB	DAS	-3	72	171	-0.33
Gordon (2006)	husbands	CWB	DAS	-9	9	86	-0.39
Gordon (2006)	husbands	CWB	DAS	-9	21	58	-0.35
Gordon (2006)	husbands	CWB	DAS	-9	57	34	-0.41
Gordon (2006)	wives	CWB	DAS	-9	9	70	-0.36
Gordon (2006)	wives	CWB	DAS	-9	21	59	-0.49
Gordon (2006)	wives	CWB	DAS	-9	57	31	-0.69
Homish, Leonard & Kearns-Bodkin (2006)	husbands	AWB	CES-D	-1	12	590	0.00
Homish, Leonard & Kearns-Bodkin (2006)	husbands	AWB	CES-D	-1	24	590	0.01
Homish, Leonard & Kearns-Bodkin (2006)	husbands	CWB	MAT	-1	12	538	-0.45
Homish, Leonard & Kearns-Bodkin (2006)	husbands	CWB	MAT	-1	24	487	-0.58
Homish, Leonard & Kearns-Bodkin (2006)	husbands	CWB	MAT	-1	48	425	-0.57
Homish, Leonard & Kearns-Bodkin (2006)	husbands	CWB	MAT	-1	84	384	-0.63

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Homish, Leonard & Kearns-Bodkin (2006)	wives	AWB	CES-D	-1	12	590	0.05
Homish, Leonard & Kearns-Bodkin (2006)	wives	AWB	CES-D	-1	24	590	0.07
Homish, Leonard & Kearns-Bodkin (2006)	wives	CWB	MAT	-1	12	538	-0.57
Homish, Leonard & Kearns-Bodkin (2006)	wives	CWB	MAT	-1	24	487	-0.76
Homish, Leonard & Kearns-Bodkin (2006)	wives	CWB	MAT	-1	48	425	-0.74
Homish, Leonard & Kearns-Bodkin (2006)	wives	CWB	MAT	-1	84	384	-0.86
Lee & Gramotnev (2007)		AWB	CES-D	-18	18	2104	0.14
Lee & Gramotnev (2007)		CWB	Self-constructed scale	-18	18	2104	0.45
Lindahl, Clements & Markman (1998)	females	CWB	MAT	-4.5	6	36	-0.11
Lindahl, Clements & Markman (1998)	females	CWB	MAT	-4.5	30.5	36	-0.44
Lindahl, Clements & Markman (1998)	females	CWB	MAT	-4.5	44.6	36	-0.61
Lindahl, Clements & Markman (1998)	females	CWB	MAT	-4.5	57.3	36	-0.34
Lindahl, Clements & Markman (1998)	females	CWB	MAT	-4.5	70	36	-0.51
Lindahl, Clements & Markman (1998)	females	CWB	MAT	-4.5	82.6	36	-0.44
Lindahl, Clements & Markman (1998)	females	CWB	MAT	-4.5	97	36	-0.52
Lindahl, Clements & Markman (1998)	males	CWB	MAT	-4.5	6	36	-0.23
Lindahl, Clements & Markman (1998)	males	CWB	MAT	-4.5	30.5	36	-0.75
Lindahl, Clements & Markman (1998)	males	CWB	MAT	-4.5	44.6	36	-0.65
Lindahl, Clements & Markman (1998)	males	CWB	MAT	-4.5	57.3	36	-0.69
Lindahl, Clements & Markman (1998)	males	CWB	MAT	-4.5	70	36	-0.74

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Lindahl, Clements & Markman (1998)	males	CWB	MAT	-4.5	82.6	36	-0.55
Lindahl, Clements & Markman (1998)	males	CWB	MAT	-4.5	97	36	-0.45
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	6	2221	0.09
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	18	2030	-0.01
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	30	1761	-0.11
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	42	1516	-0.06
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	54	1366	-0.08
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	66	1196	-0.13
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	78	1068	-0.15
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	90	931	-0.19
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	102	782	-0.21
Schumacher & Leonard (2005)	husbands	CWB	MAT	-1	12	592	-0.46
Schumacher & Leonard (2005)	husbands	CWB	MAT	-1	24	592	-0.59
Schumacher & Leonard (2005)	wives	CWB	MAT	-1	12	592	-0.59
Schumacher & Leonard (2005)	wives	CWB	MAT	-1	24	592	-0.78
Smith, Vivian & O'Leary (1990)		CWB	MAT	-1.5	6	91	-0.31
Smith, Vivian & O'Leary (1990)		CWB	MAT	-1.5	18	91	-0.46
Smith, Vivian & O'Leary (1990)		CWB	MAT	-1.5	30	91	-0.55
Tucker & Aron (1993)	husbands	CWB	MOQ	-1.9	8.3	23	-0.01
Tucker & Aron (1993)	wives	CWB	MOQ	-1.9	8.3	23	-0.24

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.11. Post-hoc effect sizes for marriage.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Brock & Lawrence (2008)	husbands	CWB	QMI	4.5	13.5	101	-0.52
Brock & Lawrence (2008)	husbands	CWB	QMI	4.5	22.5	101	-0.44
Brock & Lawrence (2008)	husbands	CWB	QMI	4.5	31.5	101	-0.33
Brock & Lawrence (2008)	wives	CWB	QMI	4.5	13.5	101	-0.36
Brock & Lawrence (2008)	wives	CWB	QMI	4.5	22.5	101	-0.33
Brock & Lawrence (2008)	wives	CWB	QMI	4.5	31.5	101	-0.15
Dehle & Weiss (1998)		CWB	DAS	19.6	22.6	94	0.00
Halford, Lizzio, Wilson & Occhipinti (2007)	husbands	CWB	DAS	2	14	126	-0.01
Halford, Lizzio, Wilson & Occhipinti (2007)	husbands	CWB	DAS	2	26	126	-0.20
Halford, Lizzio, Wilson & Occhipinti (2007)	husbands	CWB	DAS	2	38	126	-0.21
Halford, Lizzio, Wilson & Occhipinti (2007)	husbands	CWB	DAS	2	50	126	-0.18
Halford, Lizzio, Wilson & Occhipinti (2007)	wives	CWB	DAS	2	14	126	-0.10
Halford, Lizzio, Wilson & Occhipinti (2007)	wives	CWB	DAS	2	26	126	-0.26
Halford, Lizzio, Wilson & Occhipinti (2007)	wives	CWB	DAS	2	38	126	-0.24
Halford, Lizzio, Wilson & Occhipinti (2007)	wives	CWB	DAS	2	50	126	-0.24
Houts (1998)	husbands	CWB	MOQ	2	14	118	-0.75
Houts (1998)	husbands	CWB	MOQ	2	26	118	-1.23
Houts (1998)	husbands	CWB	MOQ	2	14	118	-0.66
Houts (1998)	husbands	CWB	MOQ	2	26	118	-1.08
Houts (1998)	wives	CWB	MOQ	2	14	118	-0.58
Houts (1998)	wives	CWB	MOQ	2	26	118	-0.91
Houts (1998)	wives	CWB	MOQ	2	14	118	-0.54
Houts (1998)	wives	CWB	MOQ	2	26	118	-0.89
Johnson et al. (2005)	Husbands	CWB	MAT	3	12	162	-0.24
Johnson et al. (2005)	Husbands	CWB	MAT	3	18	163	-0.19
Johnson et al. (2005)	Husbands	CWB	MAT	3	21	135	-0.34
Johnson et al. (2005)	Husbands	CWB	MAT	3	27	134	-0.41
Johnson et al. (2005)	Husbands	CWB	MAT	3	33	135	-0.40
Johnson et al. (2005)	Husbands	CWB	MAT	3	39	121	-0.56
Johnson et al. (2005)	Husbands	CWB	MAT	3	45	127	-0.51
Johnson et al. (2005)	wives	CWB	MAT	3	12	162	-0.23
Johnson et al. (2005)	wives	CWB	MAT	3	18	163	-0.24
Johnson et al. (2005)	wives	CWB	MAT	3	21	138	-0.25
Johnson et al. (2005)	wives	CWB	MAT	3	27	136	-0.45
Johnson et al. (2005)	wives	CWB	MAT	3	33	141	-0.53
Johnson et al. (2005)	wives	CWB	MAT	3	39	124	-0.03

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Johnson et al. (2005)	wives	CWB	MAT	3	45	128	-0.73
Karney & Bradbury (1997)	husbands	CWB	KMS	3	9	54	0.04
Karney & Bradbury (1997)	husbands	CWB	KMS	3	15	54	-0.36
Karney & Bradbury (1997)	husbands	CWB	KMS	3	21	54	-0.14
Karney & Bradbury (1997)	husbands	CWB	KMS	3	27	54	-0.38
Karney & Bradbury (1997)	husbands	CWB	KMS	3	33	54	-0.52
Karney & Bradbury (1997)	husbands	CWB	KMS	3	39	54	-0.45
Karney & Bradbury (1997)	husbands	CWB	KMS	3	45	54	-0.50
Karney & Bradbury (1997)	husbands	CWB	MAT	3	9	54	0.05
Karney & Bradbury (1997)	husbands	CWB	MAT	3	15	54	-0.26
Karney & Bradbury (1997)	husbands	CWB	MAT	3	21	54	-0.17
Karney & Bradbury (1997)	husbands	CWB	MAT	3	27	54	-0.43
Karney & Bradbury (1997)	husbands	CWB	MAT	3	33	54	-0.45
Karney & Bradbury (1997)	husbands	CWB	MAT	3	39	54	-0.44
Karney & Bradbury (1997)	husbands	CWB	MAT	3	45	54	-0.40
Karney & Bradbury (1997)	husbands	CWB	QMI	3	9	54	0.03
Karney & Bradbury (1997)	husbands	CWB	QMI	3	15	54	-0.34
Karney & Bradbury (1997)	husbands	CWB	QMI	3	21	54	-0.08
Karney & Bradbury (1997)	husbands	CWB	QMI	3	27	54	-0.45
Karney & Bradbury (1997)	husbands	CWB	QMI	3	33	54	-0.48
Karney & Bradbury (1997)	husbands	CWB	QMI	3	39	54	-0.49
Karney & Bradbury (1997)	husbands	CWB	QMI	3	45	54	-0.47
Karney & Bradbury (1997)	husbands	CWB	SMD	3	9	54	0.11
Karney & Bradbury (1997)	husbands	CWB	SMD	3	15	54	-0.34
Karney & Bradbury (1997)	husbands	CWB	SMD	3	21	54	-0.16
Karney & Bradbury (1997)	husbands	CWB	SMD	3	27	54	-0.36
Karney & Bradbury (1997)	husbands	CWB	SMD	3	33	54	-0.40
Karney & Bradbury (1997)	husbands	CWB	SMD	3	39	54	-0.38
Karney & Bradbury (1997)	husbands	CWB	SMD	3	45	54	-0.43
Karney & Bradbury (1997)	wives	CWB	KMS	3	9	54	-0.15
Karney & Bradbury (1997)	wives	CWB	KMS	3	15	54	-0.64
Karney & Bradbury (1997)	wives	CWB	KMS	3	21	54	-0.53
Karney & Bradbury (1997)	wives	CWB	KMS	3	27	54	-0.71
Karney & Bradbury (1997)	wives	CWB	KMS	3	33	54	-1.07
Karney & Bradbury (1997)	wives	CWB	KMS	3	39	54	-0.71
Karney & Bradbury (1997)	wives	CWB	KMS	3	45	54	-0.75
Karney & Bradbury (1997)	wives	CWB	MAT	3	9	54	0.01
Karney & Bradbury (1997)	wives	CWB	MAT	3	15	54	-0.42
Karney & Bradbury (1997)	wives	CWB	MAT	3	21	54	-0.19
Karney & Bradbury (1997)	wives	CWB	MAT	3	27	54	-0.44
Karney & Bradbury (1997)	wives	CWB	MAT	3	33	54	-0.68
Karney & Bradbury (1997)	wives	CWB	MAT	3	39	54	-0.43
Karney & Bradbury (1997)	wives	CWB	MAT	3	45	54	-0.27

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Karney & Bradbury (1997)	wives	CWB	QMI	3	9	54	-0.15
Karney & Bradbury (1997)	wives	CWB	QMI	3	15	54	-0.43
Karney & Bradbury (1997)	wives	CWB	QMI	3	21	54	-0.27
Karney & Bradbury (1997)	wives	CWB	QMI	3	27	54	-0.39
Karney & Bradbury (1997)	wives	CWB	QMI	3	33	54	-0.81
Karney & Bradbury (1997)	wives	CWB	QMI	3	39	54	-0.47
Karney & Bradbury (1997)	wives	CWB	QMI	3	45	54	-0.57
Karney & Bradbury (1997)	wives	CWB	SMD	3	9	54	-0.06
Karney & Bradbury (1997)	wives	CWB	SMD	3	15	54	-0.36
Karney & Bradbury (1997)	wives	CWB	SMD	3	21	54	-0.06
Karney & Bradbury (1997)	wives	CWB	SMD	3	27	54	-0.37
Karney & Bradbury (1997)	wives	CWB	SMD	3	33	54	-0.71
Karney & Bradbury (1997)	wives	CWB	SMD	3	39	54	-0.34
Karney & Bradbury (1997)	wives	CWB	SMD	3	45	54	-0.50
Kurdek (1999)	men	CWB	DAS	5	17	93	-0.34
Kurdek (1999)	men	CWB	DAS	5	29	93	-0.35
Kurdek (1999)	men	CWB	DAS	5	41	93	-0.56
Kurdek (1999)	men	CWB	DAS	5	53	93	-0.62
Kurdek (1999)	men	CWB	DAS	5	65	93	-0.59
Kurdek (1999)	men	CWB	DAS	5	77	93	-0.59
Kurdek (1999)	men	CWB	DAS	5	89	93	-0.58
Kurdek (1999)	men	CWB	DAS	5	101	93	-0.75
Kurdek (1999)	men	CWB	DAS	5	113	93	-0.77
Kurdek (1999)	women	CWB	DAS	5	17	93	-0.35
Kurdek (1999)	women	CWB	DAS	5	29	93	-0.39
Kurdek (1999)	women	CWB	DAS	5	41	93	-0.64
Kurdek (1999)	women	CWB	DAS	5	53	93	-0.65
Kurdek (1999)	women	CWB	DAS	5	65	93	-0.65
Kurdek (1999)	women	CWB	DAS	5	77	93	-0.73
Kurdek (1999)	women	CWB	DAS	5	89	93	-0.72
Kurdek (1999)	women	CWB	DAS	5	101	93	-0.91
Kurdek (1999)	women	CWB	DAS	5	113	93	-1.09
Neff & Karney (2007)	husbands	CWB	SMD	3	9	163	-0.36
Neff & Karney (2007)	husbands	CWB	SMD	3	15	161	-0.34
Neff & Karney (2007)	husbands	CWB	SMD	3	21	145	-0.27
Neff & Karney (2007)	husbands	CWB	SMD	3	27	139	-0.38
Neff & Karney (2007)	husbands	CWB	SMD	3	33	113	-0.36
Neff & Karney (2007)	husbands	CWB	SMD	3	39	126	-0.61
Neff & Karney (2007)	wives	CWB	SMD	3	9	163	-0.43
Neff & Karney (2007)	wives	CWB	SMD	3	15	161	-0.30
Neff & Karney (2007)	wives	CWB	SMD	3	21	149	-0.22
Neff & Karney (2007)	wives	CWB	SMD	3	27	142	-0.37
Neff & Karney (2007)	wives	CWB	SMD	3	33	116	-0.37

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Neff & Karney (2007)	wives	CWB	SMD	3	39	128	-0.59
Odell & Quinn (1998)		CWB	MAT	1	6	38	-0.18
Shebilske (2000)	husbands	CWB	MOQ	1	12	74	-0.54
Shebilske (2000)	husbands	CWB	MOQ	1	24	74	-0.84
Shebilske (2000)	husbands	CWB	MOQ	1	156	74	-1.47
Shebilske (2000)	wives	CWB	MOQ	1	12	74	-0.40
Shebilske (2000)	wives	CWB	MOQ	1	24	74	-0.55
Shebilske (2000)	wives	CWB	MOQ	1	156	74	-1.17
Watson & DeMeo (1987)	cohabitors	CWB	DAS	6	42	130	-0.19
Watson & DeMeo (1987)	Non-Cohabitors	CWB	DAS	6	42	56	-0.44

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.12. Prospective effect sizes for divorce.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	6	321	0.06
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	18	266	0.11
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	30	233	0.18
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	42	183	0.13
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	54	150	0.27
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	66	145	0.23
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	78	107	0.20
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	90	84	0.19
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	102	54	0.02
Doherty, Su & Needle (1989)	men	AWB	GWB	-12	5	21	0.25
Doherty, Su & Needle (1989)	women	AWB	GWB	-12	5	25	-0.25
Lee & Gramotnev (2007)		AWB	CES-D	-18	18	546	-0.05
Lee & Gramotnev (2007)		CWB	Self-constructed scale	-18	18	546	0.17
Lucas (2005)		CWB	Single Item	-0.5	6	860	0.05
Lucas (2005)		CWB	Single Item	-0.5	18	803	0.09
Lucas (2005)		CWB	Single Item	-0.5	30	714	0.11
Lucas (2005)		CWB	Single Item	-0.5	42	618	0.19
Lucas (2005)		CWB	Single Item	-0.5	54	542	0.19
Lucas (2005)		CWB	Single Item	-0.5	66	463	0.28
Lucas (2005)		CWB	Single Item	-0.5	78	394	0.25
Lucas (2005)		CWB	Single Item	-0.5	90	325	0.27
Lucas (2005)		CWB	Single Item	-0.5	102	271	0.18

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Menaghan & Lieberman (1986)		AWB	HSC	-24	24	32	-0.30
Prigerson, Maciejewski & Rosenheck (1999)		AWB	CES-D	-18	18	35	0.08

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.13. Post-hoc effect sizes for divorce.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Krumrei (2009)		AWB	CES-D	3.32	15	89	0.51
Lorenz, Wickrama, Conger & Elder (2006)		AWB	SCL-90-R	6	18	80	0.24
Lorenz, Wickrama, Conger & Elder (2006)		AWB	SCL-90-R	6	42	80	0.17
Lorenz, Wickrama, Conger & Elder (2006)		AWB	SCL-90-R	6	120	80	0.28
Nelson (1994)		CWB	Composite score	7	12	9	0.30
Nelson (1994)		CWB	Composite score	7	24	9	0.37
Nelson (1994)		CWB	Composite score	7	72	9	0.16
Webb (2009)		AWB	CES-D	2	8	245	0.24
Webb (2009)		AWB	CES-D	2	8	245	0.24
Webb (2009)		AWB	CES-D	2	14	235	0.40
Webb (2009)		AWB	CES-D	2	14	235	0.40

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.14. Prospective effect sizes for bereavement.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	6	411	-0.28
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	18	387	-0.10
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	30	306	-0.12
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	42	241	-0.03
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	54	190	0.00
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	66	165	-0.03
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	78	123	-0.10
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	90	99	-0.14
Anusic, Yap & Lucas (2010)		CWB	Single Item	-6	102	62	0.01
Boerner, Schulz & Horowitz (2004)		AWB	CES-D	-4	4	217	-0.03
Bond, Clark & Davies (2003)		AWB	Geriatric Depression Scale (GDS; Brink et al., 1982)	-12.5	12.5	37	0.43
Burton, Haley, Small, Finley, Dillinger-Vasille & Schonwetter (2008)		AWB	CES-D	-3.5	4.5	50	-0.74
Burton, Haley, Small, Finley, Dillinger-Vasille & Schonwetter (2008)		CWB	Life Satisfaction Index-Z (Wood, Wylie, & Sheafor, 1969)	-3.5	4.5	50	-0.21
Collins, Stommel, Wang & Given (1994)		AWB	CES-D	-11	11	47	0.24
Collins, Stommel, Wang & Given (1994)		AWB	CES-D	-11	26	47	0.49
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV - caregivers	AWB	CES-D	-3	0.5	73	-0.94
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV - caregivers	AWB	CES-D	-3	1	73	-0.47
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV - caregivers	AWB	CES-D	-3	3	73	-0.09
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV - caregivers	AWB	CES-D	-3	5	73	-0.04
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV - caregivers	AWB	CES-D	-3	7	73	0.15
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV + caregivers	AWB	CES-D	-3	0.5	37	-0.77
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV + caregivers	AWB	CES-D	-3	1	37	-0.15
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV + caregivers	AWB	CES-D	-3	3	37	0.04

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV + care-givers	AWB	CES-D	-3	5	37	0.06
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV + care-givers	AWB	CES-D	-3	7	37	0.10
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV + non-caregivers	AWB	CES-D	-3	3	53	0.12
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV + non-caregivers	AWB	CES-D	-3	5	53	0.03
Folkman, Chesney, Collette, Boccellari & Cooke (1996)	HIV + non-caregivers	AWB	CES-D	-3	7	53	0.00
Li (2005)	Early event	AWB	CES-D	-9	9	63	-0.31
Li (2005)	Early event	AWB	CES-D	-9	27	63	-0.16
Li (2005)	Early event	AWB	CES-D	-9	45	63	0.14
Li (2005)	Late event	AWB	CES-D	-9	9	52	-0.22
Li (2005)	Late event	AWB	CES-D	-9	27	52	0.26
Li (2005)	Latest event	AWB	CES-D	-9	9	42	-0.21
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	6	457	-0.39
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	18	431	-0.08
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	30	382	0.03
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	42	325	0.10
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	54	268	0.12
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	66	214	0.13
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	78	172	0.12
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	90	137	0.12
Lucas, Clark, Georgellis & Diener (2003)		CWB	Single Item	-0.5	102	102	0.26
Mullan (1992)		AWB	Self-constructed scale	-6	6	67	-0.01
Murrell & Himmelfarb (1989)		AWB	CES-D	-3	3	1479	0.05
Murrell & Himmelfarb (1989)		AWB	CES-D	-3	9	1479	0.03
Persson, Östlund, Wennman-Larsen, Wengström & Gustavsson (2008)		AWB	Swedish Health-Related Quality of Life Survey (Brorsson, Ifver, & Hays, 1993), positive affect subscale	-7.6	6	37	0.04

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Persson, Östlund, Wennman-Larsen, Wengström & Gustavsson (2008)		AWB	Swedish Health-Related Quality of Life Survey (Brorsson, Ifver, & Hays, 1993), negative affect subscale	-7.6	6	37	0.00
Prigerson, Frank, Kasl & Reynolds (1995)		AWB	CES-D	-18	18	75	-0.43
Rhee (2007)		AWB	CES-D	-6	6	210	-0.32
Rhee (2007)		AWB	CES-D	-6	18	178	-0.10
Rhee (2007)		AWB	CES-D	-6	48	85	0.19
Rossi Ferrario, Cardillo, Vicario, Balzarini & Zotti (2004)		CWB	SWLS	-2	3	93	-0.23
Rossi Ferrario, Cardillo, Vicario, Balzarini & Zotti (2004)		CWB	SWLS	-2	6	93	-0.37
Rossi Ferrario, Cardillo, Vicario, Balzarini & Zotti (2004)		CWB	SWLS	-2	12	93	-0.36
Switzer, Dew, Magistro, Goycoolea, Twillman, et al. (1998)		AWB	Depressive Affect Scale (Rosenberg, 1965)	-6	6	13	0.45
Switzer, Dew, Magistro, Goycoolea, Twillman, et al. (1998)		CWB	Single Item	-6	6	13	0.13
Torges, Stewart & Nolen-Hoeksema (2008)		AWB	Depression Inventory (Zimmerman & Coryell, 1987)	-2.2	1	147	0.26
Torges, Stewart & Nolen-Hoeksema (2008)		AWB	Depression Inventory (Zimmerman & Coryell, 1987)	-2.2	6	147	0.52
Torges, Stewart & Nolen-Hoeksema (2008)		AWB	Depression Inventory (Zimmerman & Coryell, 1987)	-2.2	18	147	0.75
Vinkers, Gussekloo, Stek, Westendorp & van der Mast (2004)		AWB	Geriatric Depression Scale-15 (Yesavage et al., 1982; Sheikh and Yesavage, 1986)	-19.2	19.2	32	-0.51

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.15. Post-hoc effect sizes for bereavement.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Aneshensel, Botticello & Yamamoto-Mitani (2004)		AWB	HSC, depression subscale	6	18	229	0.22
Aneshensel, Botticello & Yamamoto-Mitani (2004)		AWB	HSC, depression subscale	6	30	178	0.20
Aneshensel, Botticello & Yamamoto-Mitani (2004)		AWB	HSC, depression subscale	6	42	119	0.26
Aneshensel, Botticello & Yamamoto-Mitani (2004)		AWB	HSC, depression subscale	6	56	54	0.41
Beem, Maes, Cleiren, Schut & Garssen (2000)		AWB	SCL-90, depression subscale	4.3	7	64	0.21
Beem, Maes, Cleiren, Schut & Garssen (2000)		AWB	SCL-90, depression subscale	4.3	10	64	0.32
Beem, Maes, Cleiren, Schut & Garssen (2000)		AWB	SCL-90, depression subscale	4.3	13	64	0.47
Bergner, Beyer, Klapp & Rauchfuß (2009)		AWB	Depression scale by Zerssen (1976)	2	7	143	-0.70
Bergner, Beyer, Klapp & Rauchfuß (2009)		AWB	Depression scale by Zerssen (1976)	2	14	58	0.09
Broen, Moum, Bødtker & Ekeberg (2005)		AWB	HADS, depression subscale	0.3	6	40	0.35
Broen, Moum, Bødtker & Ekeberg (2005)		AWB	HADS, depression subscale	0.3	12	39	0.51
Broen, Moum, Bødtker & Ekeberg (2005)		AWB	HADS, depression subscale	0.3	60	39	0.58
Broen, Moum, Bødtker & Ekeberg (2005)		CWB	Self-constructed scale	0.3	6	40	0.37
Broen, Moum, Bødtker & Ekeberg (2005)		CWB	Self-constructed scale	0.3	12	39	0.60
Broen, Moum, Bødtker & Ekeberg (2005)		CWB	Self-constructed scale	0.3	60	39	0.57
Cordle & Prettyman (1994)		AWB	HADS, depression subscale	3	24	50	0.11
Haas-Hawkings, Sangster, Ziegler & Reid (1985)		CWB	Life Satisfaction Index-Z (Wood, Wylie, & Sheafor, 1969)	2	18	29	0.66
Hobfoll & Leiberman (1987)		AWB	CES-D, short version	0.01	3	19	0.55
Lang (2003)	husbands	CWB	ENRICH marital satisfaction scale (Fowers & Olson, 1993)	2	6	96	-0.18

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Lang (2003)	husbands	CWB	ENRICH marital satisfaction scale (Fowers & Olson, 1993)	2	13	87	-0.11
Lang (2003)	wives	CWB	ENRICH marital satisfaction scale (Fowers & Olson, 1993)	2	6	96	-0.10
Lang (2003)	wives	CWB	ENRICH marital satisfaction scale (Fowers & Olson, 1993)	2	13	87	0.04
Levy & Derby (1992)	no support groups	AWB	CES-D	3	6	96	0.36
Levy & Derby (1992)	support groups	AWB	CES-D	3	6	40	0.10
Lindström (1995)		AWB	GHQ	1.5	12	39	-0.91
Lindström (1995)		AWB	GWB	1.5	12	39	-0.78
Lund, Caserta & Dimond (1986)	females	CWB	Life satisfaction Index-A (Liang, 1984)	1	2	116	-0.05
Lund, Caserta & Dimond (1986)	females	CWB	Life satisfaction Index-A (Liang, 1984)	1	6	112	-0.08
Lund, Caserta & Dimond (1986)	females	CWB	Life satisfaction Index-A (Liang, 1984)	1	12	106	-0.08
Lund, Caserta & Dimond (1986)	females	CWB	Life satisfaction Index-A (Liang, 1984)	1	18	101	-0.13
Lund, Caserta & Dimond (1986)	females	CWB	Life satisfaction Index-A (Liang, 1984)	1	24	108	0.16
Lund, Caserta & Dimond (1986)	males	CWB	Life satisfaction Index-A (Liang, 1984)	1	2	47	-0.16
Lund, Caserta & Dimond (1986)	males	CWB	Life satisfaction Index-A (Liang, 1984)	1	6	43	-0.08
Lund, Caserta & Dimond (1986)	males	CWB	Life satisfaction Index-A (Liang, 1984)	1	12	35	0.10
Lund, Caserta & Dimond (1986)	males	CWB	Life satisfaction Index-A (Liang, 1984)	1	18	33	0.18
Lund, Caserta & Dimond (1986)	males	CWB	Life satisfaction Index-A (Liang, 1984)	1	24	31	0.23
Maciejewski, Zhang, Block & Prigerson (2007)		AWB	Single Item	3.5	11	213	0.00
Maciejewski, Zhang, Block & Prigerson (2007)		AWB	Single Item	3.5	20	205	0.39

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Middleton, Raphael, Burnett & Martinek (1997)		AWB	GHQ, depression subscale	1	2.5	115	0.06
Middleton, Raphael, Burnett & Martinek (1997)		AWB	GHQ, depression subscale	1	7	115	0.09
Middleton, Raphael, Burnett & Martinek (1997)		AWB	GHQ, depression subscale	1	13	115	0.24
Murphy, Johnson & Lohan (2002)	fathers	AWB	BSI, depression subscale	4	12	58	0.36
Murphy, Johnson & Lohan (2002)	fathers	AWB	BSI, depression subscale	4	60	58	0.34
Murphy, Johnson & Lohan (2002)	mothers	AWB	BSI, depression subscale	4	12	115	0.50
Murphy, Johnson & Lohan (2002)	mothers	AWB	BSI, depression subscale	4	60	115	0.64
Ott & Lueger (2002)	12 months after death	AWB	Self-constructed scale	12	15	19	0.07
Ott & Lueger (2002)	12 months after death	AWB	Self-constructed scale	12	18	19	0.13
Ott & Lueger (2002)	3 months after death	AWB	Self-constructed scale	3	6	18	0.42
Ott & Lueger (2002)	3 months after death	AWB	Self-constructed scale	3	9	18	0.62
Ott & Lueger (2002)	6 months after death	AWB	Self-constructed scale	6	9	20	0.33
Ott & Lueger (2002)	6 months after death	AWB	Self-constructed scale	6	12	20	0.46
Ott & Lueger (2002)	9 months after death	AWB	Self-constructed scale	9	12	27	0.06
Ott & Lueger (2002)	9 months after death	AWB	Self-constructed scale	9	15	27	0.11
Prigerson, Frank, Kasl & Reynolds (1995)		AWB	Single item	2.7	18	54	1.42
Reich, Zautra & Guarnaccia (1989)		AWB	Composite Score	3	4	58	0.04
Reich, Zautra & Guarnaccia (1989)		AWB	Composite Score	3	4	58	0.13
Surtees & Miller (1994)		AWB	GHQ	1.5	4	58	0.60

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Wijngaards-de Meij, Stroebe, Schut, Stroebe, van den Bout, van der Heijden, et al. (2008)	husbands	AWB	SCL-90, depression subscale	6	13	180	0.09
Wijngaards-de Meij, Stroebe, Schut, Stroebe, van den Bout, van der Heijden, et al. (2008)	husbands	AWB	SCL-90, depression subscale	6	20	180	0.17
Wijngaards-de Meij, Stroebe, Schut, Stroebe, van den Bout, van der Heijden, et al. (2008)	wives	AWB	SCL-90, depression subscale	6	13	180	0.10
Wijngaards-de Meij, Stroebe, Schut, Stroebe, van den Bout, van der Heijden, et al. (2008)	wives	AWB	SCL-90, depression subscale	6	20	180	0.23

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.16. Prospective effect sizes for child birth.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Affonso, Lovett, Paul & Sheptak (1990)		AWB	Schedule for Affective Disorder and Schizophrenia (SADS; Endicott & Spitzer, 1977), subscale depressed mood	-2	0.5	202	-0.29
Affonso, Lovett, Paul & Sheptak (1990)		AWB	Schedule for Affective Disorder and Schizophrenia (SADS; Endicott & Spitzer, 1977), subscale depressed mood	-2	3.5	202	0.15
Aradine & Ferketich (1990)	high risk men	AWB	CES-D	-3	1	17	0.55
Aradine & Ferketich (1990)	high risk men	AWB	CES-D	-3	4	16	0.11
Aradine & Ferketich (1990)	high risk men	AWB	CES-D	-3	0.1	19	0.38
Aradine & Ferketich (1990)	high risk women	AWB	CES-D	-3	4	39	0.39
Aradine & Ferketich (1990)	high risk women	AWB	CES-D	-3	1	43	0.26
Aradine & Ferketich (1990)	high risk women	AWB	CES-D	-3	0.1	46	0.16
Aradine & Ferketich (1990)	low risk men	AWB	CES-D	-3	1	35	-0.14

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Aradine & Ferketich (1990)	low risk men	AWB	CES-D	-3	4	29	-0.12
Aradine & Ferketich (1990)	low risk men	AWB	CES-D	-3	0.1	37	0.00
Aradine & Ferketich (1990)	low risk women	AWB	CES-D	-3	4	53	0.16
Aradine & Ferketich (1990)	low risk women	AWB	CES-D	-3	1	58	-0.31
Aradine & Ferketich (1990)	low risk women	AWB	CES-D	-3	0.1	60	-0.38
Aradine & Ferketich (1990)	premature birth men	AWB	CES-D	-3	1	27	0.88
Aradine & Ferketich (1990)	premature birth men	AWB	CES-D	-3	4	26	0.63
Aradine & Ferketich (1990)	premature birth men	AWB	CES-D	-3	0.1	32	0.18
Aradine & Ferketich (1990)	premature birth women	AWB	CES-D	-3	1	55	0.33
Aradine & Ferketich (1990)	premature birth women	AWB	CES-D	-3	4	47	0.68
Aradine & Ferketich (1990)	premature birth women	AWB	CES-D	-3	0.1	61	0.12
Armstrong (2007)	fathers	AWB	CES-D	-1.5	12.3	19	0.33
Armstrong (2007)	mothers	AWB	CES-D	-1.5	12.3	19	0.24
Austin, Tully & Parker (2007)		AWB	EPDS	-1.5	2	575	0.29
Besser, Priel & Wiznitzer (2002)	high-risk	AWB	CES-D	-4	2	100	-0.45
Besser, Priel & Wiznitzer (2002)	low-risk	AWB	CES-D	-4	2	100	-0.15
Bost, Cox, Burchinal & Payne (2002)	husbands	AWB	CES-D	-1.5	3	127	-0.10
Bost, Cox, Burchinal & Payne (2002)	husbands	AWB	CES-D	-1.5	24	132	0.06
Bost, Cox, Burchinal & Payne (2002)	husbands	AWB	CES-D	-1.5	12	132	-0.08
Bost, Cox, Burchinal & Payne (2002)	wives	AWB	CES-D	-1.5	3	126	0.32
Bost, Cox, Burchinal & Payne (2002)	wives	AWB	CES-D	-1.5	24	137	0.38
Bost, Cox, Burchinal & Payne (2002)	wives	AWB	CES-D	-1.5	12	135	0.27
Bouchard, Lachance-Grzela & Goguen (2008)	men	CWB	DAS	-2	6	143	-0.11
Bouchard, Lachance-Grzela & Goguen (2008)	women	CWB	DAS	-2	6	143	-0.28
Bradley, Ross & Warnyca (1983)	cesarean	AWB	DACL	-4.5	1.5	23	-0.02
Bradley, Ross & Warnyca (1983)	cesarean	AWB	DACL	-4.5	0.25	25	-0.68
Bradley, Ross & Warnyca (1983)	vaginal	AWB	DACL	-4.5	1.5	88	-0.24

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Bradley, Ross & Warnyca (1983)	vaginal	AWB	DACL	-4.5	0.25	90	-0.65
Buckwalter, et al. (1999)		AWB	SCL-90, depression subscale	-0.75	1	19	0.74
Buist, Morse & Durkin (2003)		AWB	EPDS	-3.5	4	152	0.42
Buist, Morse & Durkin (2003)		AWB	EPDS	-3.5	1	225	0.42
Carter, Baker & Brownell (2000)		AWB	CES-D	-2.5	12	64	0.03
Carter, Baker & Brownell (2000)		AWB	CES-D	-2.5	4	64	-0.13
Chazan (1998)		AWB	CES-D	-3	4	79	0.04
Condon, Boyce & Corkindale (2004)		CWB	DAS	-4	3	276	0.04
Condon, Boyce & Corkindale (2004)		CWB	DAS	-4	6	241	-0.02
Condon, Boyce & Corkindale (2004)		CWB	DAS	-4	12	222	-0.13
Condon, Boyce & Corkindale (2004)		AWB	EPDS	-4	12	222	0.12
Condon, Boyce & Corkindale (2004)		AWB	EPDS	-4	3	276	0.13
Condon, Boyce & Corkindale (2004)		AWB	EPDS	-4	6	241	0.14
Condon, Boyce & Corkindale (2004)		AWB	GHQ-28	-4	3	276	0.12
Condon, Boyce & Corkindale (2004)		AWB	GHQ-28	-4	6	241	0.13
Condon, Boyce & Corkindale (2004)		AWB	GHQ-28	-4	12	222	0.18
Condon, Boyce & Corkindale (2004)		AWB	PANAS, NA	-4	6	241	0.22
Condon, Boyce & Corkindale (2004)		AWB	PANAS, NA	-4	12	222	0.24
Condon, Boyce & Corkindale (2004)		AWB	PANAS, NA	-4	3	276	0.19
Condon, Boyce & Corkindale (2004)		AWB	PANAS, PA	-4	3	276	0.09
Condon, Boyce & Corkindale (2004)		AWB	PANAS, PA	-4	6	241	0.03
Condon, Boyce & Corkindale (2004)		AWB	PANAS, PA	-4	12	222	-0.02
Condon, Boyce & Corkindale (2004)		AWB	SF-36, mental health subscale	-4	3	276	0.16
Condon, Boyce & Corkindale (2004)		AWB	SF-36, mental health subscale	-4	6	241	0.16

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Condon, Boyce & Corkindale (2004)		AWB	SF-36, mental health subscale	-4	12	222	0.17
Cooke, Schmied & Sheehan (2007)	> 3 months b.f.	AWB	EPDS	-2	3	162	0.23
Cooke, Schmied & Sheehan (2007)	1,5-3 months b. f.	AWB	EPDS	-2	3	22	0.06
Cooke, Schmied & Sheehan (2007)	2 weeks breast feeding	AWB	EPDS	-2	3	20	0.47
Cooke, Schmied & Sheehan (2007)	2-6 weeks b.f.	AWB	EPDS	-2	3	25	0.46
Crittenden, Kim, Watanahe & Norr (2002)		AWB	CES-D	-1.5	36	310	0.35
Crittenden, Kim, Watanahe & Norr (2002)		AWB	CES-D	-1.5	12	435	0.26
Crittenden, Kim, Watanahe & Norr (2002)		AWB	CES-D	-1.5	24	435	0.37
Deater-Deckard, Pickering, Dunn & Golding (1998)		AWB	EPDS	-5	2	6667	0.09
DeJoseph (1997)	healthy pregnancy	AWB	CES-D	-2.5	1	218	-0.15
DeJoseph (1997)	healthy pregnancy	AWB	CES-D	-2.5	4	218	0.06
DeJoseph (1997)	healthy pregnancy	AWB	CES-D	-2.5	8	218	0.01
DeJoseph (1997)	healthy pregnancy	AWB	CES-D	-2.5	0.25	218	-0.49
DeJoseph (1997)	high-risk pregnancy	AWB	CES-D	-2.5	1	153	0.34
DeJoseph (1997)	high-risk pregnancy	AWB	CES-D	-2.5	4	153	0.55
DeJoseph (1997)	high-risk pregnancy	AWB	CES-D	-2.5	8	153	0.63
DeJoseph (1997)	high-risk pregnancy	AWB	CES-D	-2.5	0.25	153	0.18
Dulude, Bélanger, Wright & Sabourin (2002)	men	CWB	DAS	-1	11.74	45	-0.35
Dulude, Bélanger, Wright & Sabourin (2002)	men	CWB	DAS	-1	5.5	45	-0.32
Dulude, Bélanger, Wright & Sabourin (2002)	men	AWB	HSC, depression subscale	-1	11.74	45	0.10
Dulude, Bélanger, Wright & Sabourin (2002)	men	AWB	HSC, depression subscale	-1	5.5	45	0.12
Dulude, Bélanger, Wright & Sabourin (2002)	women	CWB	DAS	-1	11.74	45	-0.40
Dulude, Bélanger, Wright & Sabourin (2002)	women	CWB	DAS	-1	5.5	45	-0.21
Dulude, Bélanger, Wright & Sabourin (2002)	women	AWB	HSC, depression subscale	-1	11.74	45	0.20

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Dulude, Bélanger, Wright & Sabourin (2002)	women	AWB	HSC, depression subscale	-1	5.5	45	0.40
Durik, Hyde & Clark (2000)		AWB	CES-D	-4.5	12	167	0.24
Durik, Hyde & Clark (2000)		AWB	CES-D	-4.5	4	167	-0.27
Dyrdal & Lucas (2010)		CWB	Single item	-0.5	30	2840	-0.13
Dyrdal & Lucas (2010)		CWB	Single item	-0.5	78	1988	-0.19
Dyrdal & Lucas (2010)		CWB	Single item	-0.5	42	2795	-0.15
Dyrdal & Lucas (2010)		CWB	Single item	-0.5	18	2840	0.00
Dyrdal & Lucas (2010)		CWB	Single item	-0.5	6	2840	0.12
Dyrdal & Lucas (2010)		CWB	Single item	-0.5	90	1770	-0.23
Dyrdal & Lucas (2010)		CWB	Single item	-0.5	54	2535	-0.20
Dyrdal & Lucas (2010)		CWB	Single item	-0.5	66	2247	-0.17
Dyrdal & Lucas (2010)		CWB	Single item	-0.5	102	1599	-0.26
Evans, Heron, Francomb, Oke & Golding (2001)		AWB	EPDS	-2	8	9028	0.30
Evans, Heron, Francomb, Oke & Golding (2001)		AWB	EPDS	-2	2	9028	0.18
Feeney, Alexander, Noller & Hohaus (2003)	husbands	AWB	Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995), subscale	-5	6	76	0.05
Feeney, Alexander, Noller & Hohaus (2003)	husbands	AWB	Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995), subscale	-5	1.5	92	0.02
Feeney, Alexander, Noller & Hohaus (2003)	husbands	CWB	Marital Satisfaction Inventory (Snyder, 1979)	-5	6	76	-0.31
Feeney, Alexander, Noller & Hohaus (2003)	husbands	CWB	Marital Satisfaction Inventory (Snyder, 1979)	-5	1.5	92	-0.03
Feeney, Alexander, Noller & Hohaus (2003)	wives	AWB	Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995), subscale	-5	6	76	-0.21

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Feeney, Alexander, Noller & Hohaus (2003)	wives	AWB	Depression Anxiety Stress Scale (DASS; Lovibond & Lovibond, 1995), subscale	-5	1.5	92	-0.01
Feeney, Alexander, Noller & Hohaus (2003)	wives	CWB	Marital Satisfaction Inventory (Snyder, 1979)	-5	6	76	-0.48
Feeney, Alexander, Noller & Hohaus (2003)	wives	CWB	Marital Satisfaction Inventory (Snyder, 1979)	-5	1.5	92	-0.27
Feldman & Nash (1984)	men	CWB	adapted Satisfaction Scale	-1.5	6	18	-0.41
Feldman & Nash (1984)	men	AWB	Self-constructed scale	-1.5	6	18	0.32
Feldman & Nash (1984)	women	CWB	adapted Satisfaction Scale	-1.5	6	24	-0.87
Feldman & Nash (1984)	women	AWB	Self-constructed scale	-1.5	6	24	0.87
Figueiredo & Costa (2009)		AWB	EPDS	-3	3	19	-0.06
Fleming, Ruble, Flett & Van Wagner (1990)		AWB	Interviews, number of statements	-0.5	1	32	0.18
Fleming, Ruble, Flett & Van Wagner (1990)		AWB	Interviews, number of statements	-0.5	3	32	0.14
Fleming, Ruble, Flett & Van Wagner (1990)		AWB	Interviews, number of statements	-0.5	3	32	-0.11
Fleming, Ruble, Flett & Van Wagner (1990)		AWB	Interviews, number of statements	-0.5	16	32	-1.39
Fleming, Ruble, Flett & Van Wagner (1990)		AWB	Interviews, number of statements	-0.5	1	32	-0.36
Fleming, Ruble, Flett & Van Wagner (1990)		AWB	Interviews, number of statements	-0.5	16	32	2.04
Gee & Rhodes (1999)	Time 1 after event	AWB	SCL-90-R, depression subscale	1	13	375	0.14
Gee & Rhodes (1999)	Time 1 before event	AWB	SCL-90-R, depression subscale	-3	9	244	0.34
Gjerdingen & Center (2004)	fathers	CWB	Single item	-3	6	128	-0.44
Gjerdingen & Center (2004)	mothers	CWB	Single item	-3	6	128	-0.75

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Graetch (1990)	fathers	CWB	DAS	-3	1.5	109	0.07
Graetch (1990)	fathers	AWB	POMS	-3	1.5	109	-0.08
Graetch (1990)	mothers	CWB	DAS	-3	1.5	109	0.07
Graetch (1990)	mothers	AWB	POMS	-3	1.5	109	0.31
Graetch (1990)	mothers	AWB	SCL-90-R, depression subscale	-3	1.5	109	0.23
Grote & Bledsoe (2007)		AWB	SCL-90-R, depression subscale	-4	7	179	0.04
Grote & Bledsoe (2007)		AWB	SCL-90-R, depression subscale	-4	13.5	179	0.10
Grussu, Quatraro & Nasta (2005)	planned pregnancy	AWB	POMS, depression subscale	-0.5	12	88	-0.37
Grussu, Quatraro & Nasta (2005)	planned pregnancy	AWB	POMS, depression subscale	-0.5	1	88	-0.47
Grussu, Quatraro & Nasta (2005)	planned pregnancy	AWB	POMS, depression subscale	-0.5	6	88	-0.38
Grussu, Quatraro & Nasta (2005)	unplanned pregnancy	AWB	POMS, depression subscale	-0.5	1	31	-0.10
Grussu, Quatraro & Nasta (2005)	unplanned pregnancy	AWB	POMS, depression subscale	-0.5	12	31	0.03
Grussu, Quatraro & Nasta (2005)	unplanned pregnancy	AWB	POMS, depression subscale	-0.5	6	31	-0.17
Harwood, McLean & Durkin (2007)		CWB	DAS	-1	4.5	72	0.31
Harwood, McLean & Durkin (2007)		AWB	EPDS	-1	4.5	72	-0.39
Hjelmstedt, Widström, Wramsby & Collins (2004)	control men	CWB	Barnett Scale (Barnett et al., 1993)	-6	6	36	-0.34
Hjelmstedt, Widström, Wramsby & Collins (2004)	control women	CWB	Barnett Scale (Barnett et al., 1993)	-6	6	40	-0.86
Hjelmstedt, Widström, Wramsby & Collins (2004)	IVF men	CWB	Barnett Scale (Barnett et al., 1993)	-6	6	53	-0.50
Hjelmstedt, Widström, Wramsby & Collins (2004)	IVF women	CWB	Barnett Scale (Barnett et al., 1993)	-6	6	55	-0.52
Hock, Schirtzinger, Lutz & Widaman (1995)	husbands	CWB	Marital comparison level index (Sabatelli, 1984)	-1.5	9	142	-0.36

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Hock, Schirtzinger, Lutz & Widaman (1995)	wives	AWB	CES-D	-1.5	9	142	0.33
Hock, Schirtzinger, Lutz & Widaman (1995)	wives	AWB	CES-D	-1.5	1.5	142	0.20
Hock, Schirtzinger, Lutz & Widaman (1995)	wives	CWB	Marital comparison level index (Sabatelli, 1984)	-1.5	9	142	-0.38
Holtzman & Glass (1999)		CWB	Single item	-1.5	6	217	-0.69
Johanson, Chapman, Murray, Johnson & Cox (2000)		AWB	EPDS	-3	3	417	0.25
Jurcovicová & Válkyová (1998)	adolescents	AWB	EPDS	-5	1.5	153	0.19
Jurcovicová & Válkyová (1998)	adults	AWB	EPDS	-5	1.5	843	-0.05
Kaitz & Katzir (2004)	fathers	AWB	Expression of negative affect in interview	-0.5	3	55	-0.13
Kaitz & Katzir (2004)	fathers	AWB	Expression of negative affect in interview	-0.5	6	50	0.08
Kaitz & Katzir (2004)	fathers	AWB	Expression of negative affect in interview	-0.5	12	32	0.11
Kaitz & Katzir (2004)	fathers	AWB	Expression of positive affect in interview	-0.5	12	32	0.38
Kaitz & Katzir (2004)	fathers	AWB	Expression of positive affect in interview	-0.5	6	50	0.64
Kaitz & Katzir (2004)	fathers	AWB	Expression of positive affect in interview	-0.5	3	55	0.75
Kaitz & Katzir (2004)	mothers	AWB	Expression of negative affect in interview	-0.5	12	32	-0.26
Kaitz & Katzir (2004)	mothers	AWB	Expression of negative affect in interview	-0.5	6	50	-0.80
Kaitz & Katzir (2004)	mothers	AWB	Expression of negative affect in interview	-0.5	3	55	-0.29
Kaitz & Katzir (2004)	mothers	AWB	Expression of positive affect in interview	-0.5	12	32	0.51

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Kaitz & Katzir (2004)	mothers	AWB	Expression of positive affect in interview	-0.5	6	50	0.74
Kaitz & Katzir (2004)	mothers	AWB	Expression of positive affect in interview	-0.5	3	55	0.80
Keeton, Perry-Jenkins & Sayer (2008)	fathers	AWB	CES-D	-0.96	4.57	132	0.01
Keeton, Perry-Jenkins & Sayer (2008)	fathers	AWB	CES-D	-0.96	6.68	132	-0.02
Keeton, Perry-Jenkins & Sayer (2008)	fathers	AWB	CES-D	-0.96	12.81	132	0.09
Keeton, Perry-Jenkins & Sayer (2008)	fathers	AWB	CES-D	-0.96	1.3	132	-0.01
Keeton, Perry-Jenkins & Sayer (2008)	mothers	AWB	CES-D	-0.96	4.57	133	0.40
Keeton, Perry-Jenkins & Sayer (2008)	mothers	AWB	CES-D	-0.96	6.68	133	0.38
Keeton, Perry-Jenkins & Sayer (2008)	mothers	AWB	CES-D	-0.96	12.81	133	0.41
Keeton, Perry-Jenkins & Sayer (2008)	mothers	AWB	CES-D	-0.96	1.3	133	0.42
Klinnert, Gavin, Wamboldt & Mrazek (1992)	husbands	CWB	DAS	-1.5	12	128	-0.28
Klinnert, Gavin, Wamboldt & Mrazek (1992)	husbands	CWB	DAS	-1.5	18	128	-0.40
Klinnert, Gavin, Wamboldt & Mrazek (1992)	husbands	CWB	DAS	-1.5	6	128	-0.21
Klinnert, Gavin, Wamboldt & Mrazek (1992)	wives	CWB	DAS	-1.5	6	128	-0.30
Klinnert, Gavin, Wamboldt & Mrazek (1992)	wives	CWB	DAS	-1.5	12	128	-0.36
Klinnert, Gavin, Wamboldt & Mrazek (1992)	wives	CWB	DAS	-1.5	18	128	-0.51
Kluwer & Johnson (2007)	fathers	CWB	Self-constructed scale	-2.5	6	290	-0.32
Kluwer & Johnson (2007)	fathers	CWB	Self-constructed scale	-2.5	15	290	-0.64
Kluwer & Johnson (2007)	fathers	CWB	Self-constructed scale	-2.5	48	108	-0.96
Kluwer & Johnson (2007)	mothers	CWB	Self-constructed scale	-2.5	6	291	-0.41
Kluwer & Johnson (2007)	mothers	CWB	Self-constructed scale	-2.5	48	107	-1.07

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Kluwer & Johnson (2007)	mothers	CWB	Self-constructed scale	-2.5	15	288	-0.74
Laizner & Jeans (1990)		AWB	Multiple Affect Adjective Check List (MAACL; Zuckerman & Lubin, 1965)	-1.5	0.1	27	-0.71
Lawrence, Rothman, Cobb, Rothman & Bradbury (2008)	husbands	CWB	QMI	-1	6	104	-0.26
Lawrence, Rothman, Cobb, Rothman & Bradbury (2008)	husbands	CWB	QMI	-1	12	104	-0.50
Lawrence, Rothman, Cobb, Rothman & Bradbury (2008)	wives	CWB	QMI	-1	12	104	-0.55
Lawrence, Rothman, Cobb, Rothman & Bradbury (2008)	wives	CWB	QMI	-1	6	104	-0.42
Lee & Doherty (2007)		CWB	DAS	-4.5	12	141	-0.24
Lee & Doherty (2007)		CWB	DAS	-4.5	6	141	-0.09
Lee & Gramotnev (2007)		AWB	CES-D	-18	18	1079	0.02
Lee & Gramotnev (2007)		CWB	Self-constructed scale	-18	18	1079	-0.05
Levy-Schiff (1994)	men	CWB	MAT	-2	8.5	102	-0.23
Levy-Schiff (1994)	women	CWB	MAT	-2	8.5	102	-0.46
Lewis & Cooper (1988)	dual earner fathers	AWB	Crown Crisp Experiential Index (Crown & Crisp, 1979), depression subscale	-1	5	26	-0.24
Lewis & Cooper (1988)	dual earner fathers	CWB	Job dissatisfaction scale (Davidson & Cooper, 1983)	-1	5	26	-0.05
Lewis & Cooper (1988)	dual earner fathers	CWB	Life Dissatisfaction Scale (adapted from Warr et al., 1979)	-1	5	26	-0.11
Lewis & Cooper (1988)	dual earner mothers	AWB	Crown Crisp Experiential Index (Crown & Crisp, 1979), depression subscale	-1	5	26	0.05
Lewis & Cooper (1988)	dual earner mothers	CWB	Job dissatisfaction scale (Davidson & Cooper, 1983)	-1	5	26	0.10

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Lewis & Cooper (1988)	dual earner mothers	CWB	Life Dissatis-faction Scale (adapted from Warr et al., 1979)	-1	5	26	-0.81
Lewis & Cooper (1988)	single earner fathers	AWB	Crown Crisp Experiential Index (Crown & Crisp, 1979), depres-sion subscale	-1	5	15	-0.29
Lewis & Cooper (1988)	single earner fathers	CWB	Job dissatis-faction scale (Davidson & Cooper, 1983)	-1	5	15	0.40
Lewis & Cooper (1988)	single earner fathers	CWB	Life Dissatis-faction Scale (adapted from Warr et al., 1979)	-1	5	15	-1.24
Lewis & Cooper (1988)	single earner mothers	AWB	Crown Crisp Experiential Index (Crown & Crisp, 1979), depres-sion subscale	-1	5	15	-0.10
Lewis & Cooper (1988)	single earner mothers	CWB	Life Dissatis-faction Scale (adapted from Warr et al., 1979)	-1	5	15	-1.14
Limlomwongse & Liabsuetra-kul (2006)		AWB	EPDS	-0.5	2	525	0.16
Luo (2006)	fathers	CWB	Single item	-1.5	1.5	114	-0.22
Luo (2006)	mothers	CWB	Single item	-1.5	1.5	114	-0.23
Meijer & van den Wittenboer (2007)	fathers	CWB	Scale by Lan-ge (1983)	-0.5	12	78	-0.50
Meijer & van den Wittenboer (2007)	fathers	CWB	Scale by Lan-ge (1983)	-0.5	1.75	73	-0.14
Meijer & van den Wittenboer (2007)	mothers	CWB	Scale by Lan-ge (1983)	-0.5	12	84	-0.78
Meijer & van den Wittenboer (2007)	mothers	CWB	Scale by Lan-ge (1983)	-0.5	1.75	83	-0.20
Moore (2003)	fathers	CWB	Quality of Relationship Inventory (QRI; Pierce, Sarason, & Sarason, 1991)	-3	12	129	-0.32

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Moore (2003)	mothers	CWB	Quality of Relationship Inventory (QRI; Pierce, Sarason, & Sarason, 1991)	-3	12	129	-0.69
O'Hara, Zekoski, Philipps & Wright (1990)		CWB	DAS	-1	2.25	182	-0.10
Pancer, Pratt, Hunsberger & Gallant (2000)	fathers	AWB	CES-D	-3	6	69	-0.13
Pancer, Pratt, Hunsberger & Gallant (2000)	fathers	CWB	MAT	-3	6	69	-0.31
Pancer, Pratt, Hunsberger & Gallant (2000)	mothers	AWB	CES-D	-3	6	69	-0.03
Pancer, Pratt, Hunsberger & Gallant (2000)	mothers	CWB	MAT	-3	6	69	-0.68
Perren, von Wyl, Bürgin, Simoni & von Klitzing (2005)	fathers	AWB	EPDS	-4	12	51	0.77
Perren, von Wyl, Bürgin, Simoni & von Klitzing (2005)	fathers	AWB	EPDS	-4	18	40	1.03
Perren, von Wyl, Bürgin, Simoni & von Klitzing (2005)	fathers	AWB	EPDS	-4	1	49	0.17
Perren, von Wyl, Bürgin, Simoni & von Klitzing (2005)	fathers	AWB	EPDS	-4	3	52	0.19
Perren, von Wyl, Bürgin, Simoni & von Klitzing (2005)	fathers	CWB	Partnership Questionnaire (PFB; Hahlweg, 1996)	-4.5	12	46	-0.73
Perren, von Wyl, Bürgin, Simoni & von Klitzing (2005)	mothers	AWB	EPDS	-4	18	60	0.71
Perren, von Wyl, Bürgin, Simoni & von Klitzing (2005)	mothers	AWB	EPDS	-4	12	72	0.49
Perren, von Wyl, Bürgin, Simoni & von Klitzing (2005)	mothers	AWB	EPDS	-4	3	73	0.28
Perren, von Wyl, Bürgin, Simoni & von Klitzing (2005)	mothers	AWB	EPDS	-4	1	66	0.07
Perren, von Wyl, Bürgin, Simoni & von Klitzing (2005)	mothers	CWB	Partnership Questionnaire (PFB; Hahlweg, 1996)	-4.5	12	54	-1.02
Porter & Hsu (2003)		CWB	Marital quality questionnaire (Braiker & Kelley, 1979)	-2	3	50	-0.37
Porter & Hsu (2003)		CWB	Marital quality questionnaire (Braiker & Kelley, 1979)	-2	3	50	-0.12

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Porter & Hsu (2003)		CWB	Marital quality questionnaire (Braiker & Kelley, 1979)	-2	1	52	-0.12
Porter & Hsu (2003)		CWB	Marital quality questionnaire (Braiker & Kelley, 1979)	-2	1	52	-0.29
Post (1998)		AWB	Current Feelings Scale (Ruble et al., 1990)	-3	3.5	50	1.83
Priel & Besser (2002)		AWB	CES-D	-1	2	120	-0.14
Quadagno, Dixon, Denney & Buck (1986)		AWB	Single item	-3	6	42	0.22
Quadagno, Dixon, Denney & Buck (1986)		AWB	Single item	-3	0.01	42	0.88
Rholes, Simpson, Campbell & Grich (2001)	husbands	CWB	DAS, satisfaction subscale	-1.5	6	106	-0.42
Rholes, Simpson, Campbell & Grich (2001)	wives	CWB	DAS, satisfaction subscale	-1.5	6	106	-0.52
Rotman (2006)	fathers	AWB	CES-D	-1.5	3	101	0.30
Rotman (2006)	fathers	AWB	CES-D	-1.5	12	32	0.23
Rotman (2006)	fathers	AWB	CES-D	-1.5	30	18	0.26
Rotman (2006)	fathers	CWB	MAT	-1.5	30	26	-0.47
Rotman (2006)	fathers	CWB	MAT	-1.5	12	38	-0.51
Rotman (2006)	fathers	CWB	MAT	-1.5	3	117	-0.18
Rotman (2006)	mothers	AWB	CES-D	-1.5	30	23	0.35
Rotman (2006)	mothers	AWB	CES-D	-1.5	12	37	0.36
Rotman (2006)	mothers	AWB	CES-D	-1.5	3	108	0.39
Rotman (2006)	mothers	CWB	MAT	-1.5	3	120	-0.13
Rotman (2006)	mothers	CWB	MAT	-1.5	30	27	-0.64
Rotman (2006)	mothers	CWB	MAT	-1.5	12	44	-0.59
Salmela-Aro, Aunola, Saisto, Halmesmäki & Nurmi (2006)		CWB	DAS	-1	24	314	-0.40
Salmela-Aro, Aunola, Saisto, Halmesmäki & Nurmi (2006)		CWB	DAS	-1	3	314	0.00
Seimyr, Edhborg, Lundhand, Sjögren (2004)		AWB	EPDS	-2	12	235	0.38
Seimyr, Edhborg, Lundhand, Sjögren (2004)		AWB	EPDS	-2	2	326	0.17
Sieber, Germann, Barbir & Ehlert (2006)		AWB	SCL-90-R, depression subscale	-3	13	58	0.02
Soliday, McCluskey-Fawcett & O'Brien (1999)	fathers	AWB	CES-D	-1	1	51	0.08
Soliday, McCluskey-Fawcett & O'Brien (1999)	fathers	CWB	DAS, short form	-1	1	51	0.11

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Soliday, McCluskey-Fawcett & O'Brien (1999)	fathers	AWB	PANAS, NA	-1	1	51	0.01
Soliday, McCluskey-Fawcett & O'Brien (1999)	fathers	AWB	PANAS, PA	-1	1	51	0.30
Soliday, McCluskey-Fawcett & O'Brien (1999)	mothers	AWB	CES-D	-1	1	51	-0.40
Soliday, McCluskey-Fawcett & O'Brien (1999)	mothers	CWB	DAS, short form	-1	1	51	0.00
Soliday, McCluskey-Fawcett & O'Brien (1999)	mothers	AWB	PANAS, NA	-1	1	51	-0.57
Soliday, McCluskey-Fawcett & O'Brien (1999)	mothers	AWB	PANAS, PA	-1	1	51	-0.02
Tucker & Aron (1993)	husbands	CWB	MOQ	-1.9	8.3	25	-0.29
Tucker & Aron (1993)	wives	CWB	MOQ	-1.9	8.3	25	-0.26
Wright, Henggeler & Craig (1986)	husbands	CWB	DAS, satisfac-tion subscale	-2	3.5	41	-0.05
Wright, Henggeler & Craig (1986)	wives	CWB	DAS, satisfac-tion subscale	-2	3.5	41	-0.11
Yong-Ku, Ji-Won, Kye-Hyun, Kang-Sub & Young-Chul (2008)		AWB	EPDS	-4	1.5	60	0.27
Yong-Ku, Ji-Won, Kye-Hyun, Kang-Sub & Young-Chul (2008)		AWB	EPDS	-4	0.25	60	-0.04

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.17. Post-hoc effect sizes for child birth.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Ahlborg, Misvaer & Möller (2009)	with add. Child	CWB	DAS	6	48	253	-0.48
Ahlborg, Misvaer & Möller (2009)	without add. Child	CWB	DAS	6	48	51	-0.44
Ahn (2001)		AWB	MHI	0.045	1.5	152	-0.23
Ahn (2001)		AWB	MHI	0.045	3	131	0.00
Beeghly, Weinberg, Olson, Kernan, Riley & Tronick (2002)		AWB	CES-D	2	3	106	0.39
Beeghly, Weinberg, Olson, Kernan, Riley & Tronick (2002)		AWB	CES-D	2	3	163	-0.11

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Beeghly, Weinberg, Olson, Kernan, Riley & Tronick (2002)		AWB	CES-D	2	6	106	0.37
Beeghly, Weinberg, Olson, Kernan, Riley & Tronick (2002)		AWB	CES-D	2	6	163	-0.01
Beeghly, Weinberg, Olson, Kernan, Riley & Tronick (2002)		AWB	CES-D	2	12	106	0.48
Beeghly, Weinberg, Olson, Kernan, Riley & Tronick (2002)		AWB	CES-D	2	12	163	0.01
Beeghly, Weinberg, Olson, Kernan, Riley & Tronick (2002)		AWB	CES-D	2	18	163	-0.13
Boyce, Hickie & Parker (1991)		AWB	EPDS	-1	3	128	0.18
Boyce, Hickie & Parker (1991)		AWB	EPDS	-1	6	140	0.33
Broom (1998)	dual-earner fathers	AWB	ABS	3	30	19	-0.46
Broom (1998)	dual-earner fathers	CWB	QMI	3	30	19	-0.74
Broom (1998)	dual-earner mothers	AWB	ABS	3	30	19	-0.16
Broom (1998)	dual-earner mothers	CWB	QMI	3	30	19	-1.04
Broom (1998)	single-earner fathers	AWB	ABS	3	30	21	0.09
Broom (1998)	single-earner fathers	CWB	QMI	3	30	21	-1.06
Broom (1998)	single-earner mothers	AWB	ABS	3	30	21	0.31
Broom (1998)	single-earner mothers	CWB	QMI	3	30	21	-0.99
Dagher (2008)		AWB	EPDS	1.5	3	638	0.17
Dagher (2008)		AWB	EPDS	1.5	6	603	0.17
Dagher (2008)		AWB	EPDS	1.5	12	544	0.21
Finello, Litton, deLemos & Chan (1998)		AWB	CES-D	1	12	63	-0.11
Gameiro, Moura-Ramos & Canavarro (2009)	multiparious	AWB	BSI, depression subscale	0.1	8	26	0.50
Gameiro, Moura-Ramos & Canavarro (2009)	multiparious	AWB	Visual analogue scale	0.1	8	19	-0.85
Gameiro, Moura-Ramos & Canavarro (2009)	primiparious	AWB	BSI, depression subscale	0.1	8	26	0.11
Gameiro, Moura-Ramos & Canavarro (2009)	primiparious	AWB	Visual analogue scale	0.1	8	19	0.09
Hayes (2003)	female	CWB	DAS	3	5	22	0.03
Hayes (2003)	female	CWB	DAS	3	7	22	-0.04
Hayes (2003)	female	CWB	DAS	3	9	22	0.13

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Hayes (2003)	female	AWB	PANAS, PA	3	5	22	0.12
Hayes (2003)	female	AWB	PANAS, PA	3	7	22	0.16
Hayes (2003)	female	AWB	PANAS, PA	3	9	22	0.15
Hayes (2003)	male	CWB	DAS	3	5	22	-0.11
Hayes (2003)	male	CWB	DAS	3	7	22	0.01
Hayes (2003)	male	CWB	DAS	3	9	22	0.06
Hayes (2003)	male	AWB	PANAS, PA	3	5	21	0.25
Hayes (2003)	male	AWB	PANAS, PA	3	7	21	-0.02
Hayes (2003)	male	AWB	PANAS, PA	3	9	21	0.14
Hobfoll & Leiberman (1987)	caesarian birth	AWB	CES-D, short version	0.02	3	22	0.88
Hobfoll & Leiberman (1987)	normal birth	AWB	CES-D, short version	0.02	3	24	0.18
Hobfoll & Leiberman (1987)	premature birth	AWB	CES-D, short version	0.02	3	28	0.09
Kermode, Fisher & Jolley (2000)	private patients	AWB	POMS	-1.5	2	159	0.26
Kermode, Fisher & Jolley (2000)	private patients	AWB	POMS	-1.5	8	159	0.13
Kermode, Fisher & Jolley (2000)	public patients	AWB	POMS	-1.5	2	132	0.27
Kermode, Fisher & Jolley (2000)	public patients	AWB	POMS	-1.5	8	132	0.03
Levitt, Coffman, Guacci-Franco & Loveless (1993)		CWB	Self-constructed scale	1	13	43	-0.63
Lu (2004)	fathers	CWB	Single item	1.5	6	90	0.19
Lu (2004)	mothers	CWB	Single item	1.5	6	90	-0.04
McKenry, Browne, Kotch & Symons (1990)		AWB	CES-D	1	12	157	0.19
Pridham, Lin & Brown (2001)	BPD History	AWB	CES-D	1	4	31	-0.08
Pridham, Lin & Brown (2001)	BPD History	AWB	CES-D	1	8	31	-0.02
Pridham, Lin & Brown (2001)	BPD History	AWB	CES-D	1	12	31	-0.24
Pridham, Lin & Brown (2001)	Healthy Term	AWB	CES-D	1	4	49	0.12
Pridham, Lin & Brown (2001)	Healthy Term	AWB	CES-D	1	8	49	0.10
Pridham, Lin & Brown (2001)	Healthy Term	AWB	CES-D	1	12	49	0.17
Pridham, Lin & Brown (2001)	RDS History	AWB	CES-D	1	4	23	0.04
Pridham, Lin & Brown (2001)	RDS History	AWB	CES-D	1	8	23	-0.04
Pridham, Lin & Brown (2001)	RDS History	AWB	CES-D	1	12	23	0.32
Singer et al. (1999)	Infants with Bronchopulmonary dysplasia	AWB	BSI, depression subscale	1	8	64	0.37
Singer et al. (1999)	Infants with Bronchopulmonary dysplasia	AWB	BSI, depression subscale	1	12	64	0.38

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Singer et al. (1999)	Infants with Bronchopul-monary dysplasia	AWB	BSI, depressi-on subscale	1	24	64	0.26
Singer et al. (1999)	Infants with Bronchopul-monary dysplasia	AWB	BSI, depressi-on subscale	1	36	64	0.30
Singer et al. (1999)	infants with VLBW	AWB	BSI, depressi-on subscale	1	8	33	0.29
Singer et al. (1999)	infants with VLBW	AWB	BSI, depressi-on subscale	1	12	33	0.26
Singer et al. (1999)	infants with VLBW	AWB	BSI, depressi-on subscale	1	24	33	0.38
Singer et al. (1999)	infants with VLBW	AWB	BSI, depressi-on subscale	1	36	33	0.31
Singer et al. (1999)	Term	AWB	BSI, depressi-on subscale	1	8	87	0.01
Singer et al. (1999)	Term	AWB	BSI, depressi-on subscale	1	12	89	0.07
Singer et al. (1999)	Term	AWB	BSI, depressi-on subscale	1	24	79	0.10
Singer et al. (1999)	Term	AWB	BSI, depressi-on subscale	1	36	80	-0.04
Slade, Emerson & Freedlan-der (1999)	early cleft lip repair	AWB	EPDS	0.5	3	18	0.19
Slade, Emerson & Freedlan-der (1999)	early cleft lip repair	AWB	EPDS	0.5	6	19	0.46
Slade, Emerson & Freedlan-der (1999)	late cleft lip repair	AWB	EPDS	0.5	3	9	0.66
Slade, Emerson & Freedlan-der (1999)	late cleft lip repair	AWB	EPDS	0.5	6	9	0.67
Uguz, Kaya, Sahingoz, Cilli & Akman (2008)		AWB	EPDS	1.5	12	34	2.44
Van der Wal (2001)	fathers	CWB	DAS	4	7	9	-0.16
Van der Wal (2001)	mothers	CWB	DAS	4	7	11	0.14
White, Matthey, Boyd & Bar-nett (2006)		AWB	EPDS	1.5	6	275	0.08
White, Matthey, Boyd & Bar-nett (2006)		AWB	EPDS	1.5	12	258	0.13
Wicki (1999)	husbands	AWB	Adaptation of a well-being scale by Grob et al. (1991)	4	16	164	-0.19
Wicki (1999)	wives	AWB	Adaptation of a well-being scale by Grob et al. (1991)	4	16	164	-0.19

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.18. Prospective effect sizes for health problems in relative.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
King et al. (2001)		AWB	CES-D	-0.25	2	131	-0.38
Konstam et al. (1998)		CWB	DAS	-7	1	16	-0.21
Konstam et al. (1998)		CWB	DAS	-7	4	14	-0.04
Nieboer et al. (1998)		AWB	CES-D	-0.6	6	108	0.50
Nieboer et al. (1998)		AWB	HADS, depression subscale	-18	3	127	-0.09
Ruiz, Matthews, Scheier & Schulz (2006)		AWB	CES-D	-0.3	18	97	0.62
Thornton, Perez & Meyerowitz (2004)		CWB	DAS	-0.5	0.75	62	0.02
Thornton, Perez & Meyerowitz (2004)		CWB	DAS	-0.5	12	62	-0.02
Thornton, Perez & Meyerowitz (2004)		AWB	PANAS, NA	-0.5	0.75	62	0.07
Thornton, Perez & Meyerowitz (2004)		AWB	PANAS, NA	-0.5	12	62	0.87
Thornton, Perez & Meyerowitz (2004)		AWB	PANAS, PA	-0.5	0.75	61	-0.04
Thornton, Perez & Meyerowitz (2004)		AWB	PANAS, PA	-0.5	12	63	0.12

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.19. Post-hoc effect sizes for health problems in relative.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Arefjord, Hallaråkeri, Havik & Mæland (1998)		AWB	Global interviewer rating	0.25	120	37	-0.10
Arefjord, Hallaråkeri, Havik & Mæland (1998)		AWB	Global interviewer rating	0.25	3.25	52	-0.23
Artinian (1992)		CWB	DAS	0.05	12	47	-0.05
Artinian (1992)		CWB	DAS	0.05	1.5	47	-0.28
Badr, Acitelli & Taylor (2008)	men	CWB	DAS	2.3	5.3	119	0.04
Badr, Acitelli & Taylor (2008)	men	CWB	DAS	2.3	8.3	97	0.39
Badr, Acitelli & Taylor (2008)	women	CWB	DAS	2.3	5.3	119	-0.17
Badr, Acitelli & Taylor (2008)	women	CWB	DAS	2.3	8.3	97	-0.12
Dahlquist, Czyzewski & Jones (1996)	fathers	CWB	DAS	2	20	42	-0.09

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Dahlquist, Czyzewski & Jones (1996)	mothers	CWB	DAS	2	20	42	-0.04
Dolgin et al. (2007)		AWB	POMS	2	5	212	0.19
Dolgin et al. (2007)		AWB	POMS	2	7.5	212	0.34
Ellis (1998)		CWB	DAS	2.5	5.5	30	0.09
Ellis (1998)		AWB	POMS	2.5	5.5	30	0.39
Ellis (1998)		AWB	POMS, vigor subscale	2.5	5.5	30	0.31
Forsberg-Wärleby, Möller & Blomstrand (2004)		AWB	GWB	0.3	4	66	0.79
Forsberg-Wärleby, Möller & Blomstrand (2004)		AWB	GWB	0.3	12	66	0.75
Goldbeck et al. (2001)		AWB	POMS, depression subscale	1	3.5	18	0.22
Goldbeck et al. (2001)		CWB	Ulmer Lebensqualitätsinventar für Eltern eines chronisch krankes Kindes (ULQIE; Goldbeck et al., 1998)	0.4	2.5	66	0.47
Kaye & Gracely (1993)		AWB	Psychological Adjustment to Illness Scale (PAIS; Derogatis & Lopez, 1983) subscale psychological distress	0.05	3	15	-0.18
Kaye & Gracely (1993)		AWB	Psychological Adjustment to Illness Scale (PAIS; Derogatis & Lopez, 1983) subscale psychological distress	0.05	6	15	-0.22
Kurtz, Kurtz, Given & Given (2004)		AWB	CES-D	1	13	351	0.32
Kurtz, Kurtz, Given & Given (2004)		AWB	CES-D	1	7	385	0.27
Kurtz, Kurtz, Given & Given (2004)		AWB	CES-D	1	3.5	409	0.12
Lucke, Coccia, Goode & Lucke (2004)		AWB	SF-36, mental health subscale	1	3	5	0.59

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Lucke, Coccia, Goode & Lucke (2004)		AWB	SF-36, mental health subscale	1	6	5	0.40
Magni, Carli, de Leo, Tschilolo & Zanesco (2008)		AWB	SCL-90, depression subscale	0.1	20	17	0.14
Magni, Carli, de Leo, Tschilolo & Zanesco (2008)		AWB	SCL-90, depression subscale	0.1	8	41	0.16
Manne et al. (2007)		CWB	DAS	4.5	14	235	0.01
Manne et al. (2007)		CWB	DAS	4.5	24	235	0.01
Manne et al. (2007)		AWB	MHI, subscale	4.5	14	235	0.15
Manne et al. (2007)		AWB	MHI, subscale	4.5	24	235	0.26
Nir, Greenberger & Bachner (2009)		CWB	Short World Health Organization Quality of Life Assessment (Power & Kuyken, 1996)	0.25	3	137	-0.22
Nir, Greenberger & Bachner (2009)		CWB	Short World Health Organization Quality of Life Assessment (Power & Kuyken, 1996)	0.25	6	132	0.22
Northouse, Mood, Templin, Mellon & George (2000)	men	CWB	DAS	2	12	22	-0.09
Northouse, Mood, Templin, Mellon & George (2000)	women	CWB	DAS	2	12	34	-0.21
Northouse, Templin, Mood & Oberst (1998)	benign	CWB	DAS	0.2	2	73	-0.04
Northouse, Templin, Mood & Oberst (1998)	benign	CWB	DAS	0.2	12	73	0.00
Northouse, Templin, Mood & Oberst (1998)	malignant	CWB	DAS	0.2	2	53	-0.02
Northouse, Templin, Mood & Oberst (1998)	malignant	CWB	DAS	0.2	12	53	-0.20
Offner (2002)		AWB	CES-D	1.5	3	50	0.06
Offner (2002)		AWB	CES-D	1.5	6	50	0.00
Omne-Pontén, Holmberg, Bergström, Sjödén & Burns (1993)	breast conserving	AWB	Self-constructed scale	4	13	19	-0.01
Omne-Pontén, Holmberg, Bergström, Sjödén & Burns (1993)	breast conserving	CWB	Self-constructed scale	4	13	19	-0.21

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Omne-Pontén, Holmberg, Bergström, Sjödén & Burns (1993)	mastectomy	AWB	Self-constructed scale	4	13	31	0.04
Omne-Pontén, Holmberg, Bergström, Sjödén & Burns (1993)	mastectomy	CWB	Self-constructed scale	4	13	31	-0.59
Rankin & Monahan (1991)		AWB	POMS	1	3	70	0.14
Rothman (2006)		AWB	POMS, brief version	2.5	12	587	0.48
Schlote, Richter, Frank & Wallesch (2006)		AWB	SF-36, mental health subscale	1.5	9	63	0.47
Schlote, Richter, Frank & Wallesch (2006)		AWB	SF-36, mental health subscale	1.5	16	61	0.45
Schulz, Tompkins & Rau (1988)		AWB	CES-D	1.8	8	140	-0.03
Schulz, Tompkins & Rau (1988)		AWB	Index of Psychological Well-Being (IPWB); Berkman, 1971, subscale	1.8	8	140	0.00
Schulz, Tompkins & Rau (1988)		AWB	Index of Psychological Well-Being (IPWB); Berkman, 1971, subscale	1.8	8	140	0.10
Shelby, Sullivan, Groussman, Gray & Saffle (1992)		AWB	DACL	0.05	0.85	14	0.46
Suitor & Pillemer (1994)		CWB	DAS (modified)	3	15	94	0.03
Surtees & Miller (1994)		AWB	GHQ	1.5	4	126	0.34
Teel, Duncan & Lai (2001)		AWB	CES-D	1	3	83	0.03
Teel, Duncan & Lai (2001)		AWB	CES-D	1	6	83	0.08
van Puymbroeck & Rittman (2005)		AWB	Geriatric Depression Scale (GDS; Brink et al., 1982)	1	6	92	0.03
Visser-Meily, Post, van de Port, van Heugten & van den Bos (2008)		CWB	Self-constructed scale	12	36	119	-0.14
Wade, Taylor, Drotar, Stancin & Yeates (1998)	moderate TBI	CWB	DAS	0.7	7	32	-0.03
Wade, Taylor, Drotar, Stancin & Yeates (1998)	moderate TBI	CWB	DAS	0.7	12	32	-0.18
Wade, Taylor, Drotar, Stancin & Yeates (1998)	ORTHO	CWB	DAS	0.7	12	29	-0.32
Wade, Taylor, Drotar, Stancin & Yeates (1998)	ORTHO	CWB	DAS	0.7	7	29	-0.42

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Wade, Taylor, Drotar, Stancin & Yeates (1998)	severe TBI	CWB	DAS	0.7	12	25	-0.38
Wade, Taylor, Drotar, Stancin & Yeates (1998)	severe TBI	CWB	DAS	0.7	7	25	-0.65
White, Poissant, Coté-LeBlanc & Wood-Dauphinee (2006)		AWB	SF-36, mental health subscale	18	24	44	-0.09
Wijnberg-Williams, Kamps, Klip & Hoekstra-Weebers (2006)	fathers	AWB	GHQ-12	0.25	60	46	1.52
Wijnberg-Williams, Kamps, Klip & Hoekstra-Weebers (2006)	fathers	AWB	GHQ-12	0.25	6	46	0.73
Wijnberg-Williams, Kamps, Klip & Hoekstra-Weebers (2006)	fathers	AWB	GHQ-12	0.25	12	46	1.11
Wijnberg-Williams, Kamps, Klip & Hoekstra-Weebers (2006)	mothers	AWB	GHQ-12	0.25	6	50	0.65
Wijnberg-Williams, Kamps, Klip & Hoekstra-Weebers (2006)	mothers	AWB	GHQ-12	0.25	60	50	1.66
Wijnberg-Williams, Kamps, Klip & Hoekstra-Weebers (2006)	mothers	AWB	GHQ-12	0.25	12	50	1.29
Wright, Hickey, Buckwalter, Hendrix & Kelechi (1999)		AWB	Short Zung Interviewer Assisted Depression Scale (Tucker et al., 1986)	3	9	7	0.11
Wright, Hickey, Buckwalter, Hendrix & Kelechi (1999)		AWB	Short Zung Interviewer Assisted Depression Scale (Tucker et al., 1986)	3	15	7	-0.02

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.20. Prospective effect sizes for unemployment.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Ali & Avison (1997)	married mothers	AWB	CES-D	-9	9	32	0.09
Ali & Avison (1997)	single mothers	AWB	CES-D	-9	9	38	-0.03
Donovan, Oddy, Pardoe & Ades (1986)	female	AWB	GHQ	-2	7	14	-0.10
Donovan, Oddy, Pardoe & Ades (1986)	male	AWB	GHQ	-2	7	26	-0.45
Gallo et al. (2006)		AWB	CES-D, short form	-12	12	231	0.00
Gallo et al. (2006)		AWB	CES-D, short form	-12	36	231	0.04
Gallo et al. (2006)		AWB	CES-D, short form	-12	60	231	-0.18
Ginexi, Howe & Caplan (2000)		AWB	CES-D	-3.4	3.4	19	0.00
Isaksson (1990)		AWB	GHQ	-6	6	9	-1.09
Jackson, Stafford, Banks & Warr (1983)	first cohort t1 + t2	AWB	GHQ	-4	4	27	-0.43
Jackson, Stafford, Banks & Warr (1983)	first cohort t2 + t3	AWB	GHQ	-7.5	7.5	58	-0.94
Jackson, Stafford, Banks & Warr (1983)	second cohort	AWB	GHQ	-8	8	60	-0.66
Leci et al. (1984)		AWB	GHQ	-1	1	70	-0.37
Leci et al. (1984)		AWB	GHQ	-1	3	70	-0.19
Lee & Gramotnev (2007)		AWB	CES-D	-18	18	716	-0.02
Lee & Gramotnev (2007)		CWB	Self-constructed scale	-18	18	716	0.04
Lucas, Clark, Georgellis & Diener (2004)		CWB	Single item	-0.5	6	4066	-0.29
Lucas, Clark, Georgellis & Diener (2004)		CWB	Single item	-0.5	18	3289	0.02
Lucas, Clark, Georgellis & Diener (2004)		CWB	Single item	-0.5	30	2817	0.01
Lucas, Clark, Georgellis & Diener (2004)		CWB	Single item	-0.5	42	2391	0.00
Lucas, Clark, Georgellis & Diener (2004)		CWB	Single item	-0.5	54	1955	0.04
Lucas, Clark, Georgellis & Diener (2004)		CWB	Single item	-0.5	66	1548	0.03
Lucas, Clark, Georgellis & Diener (2004)		CWB	Single item	-0.5	78	1220	0.04
Lucas, Clark, Georgellis & Diener (2004)		CWB	Single item	-0.5	90	942	0.06
Lucas, Clark, Georgellis & Diener (2004)		CWB	Single item	-0.5	102	670	0.13

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Prause & Dooley (2001)		AWB	CES-D	-12	12	54	-0.35
Shamir (1986)		AWB	DACL	-3.5	3.5	65	0.66
Shamir (1986)		AWB	DACL	-3.5	3.5	14	-0.43
Winefield & Tiggemann (1990)		AWB	Depressive Affect Scale (Rosenberg, 1965)	-6	6	30	-0.19
Winefield & Tiggemann (1990)		AWB	Self-constructed scale	-6	6	30	-0.25

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.21. Post-hoc effect sizes for unemployment.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Lai & Chan (2002)		AWB	GHQ	33	41	48	-0.48
Lai & Chan (2002)		CWB	SWLS	33	41	48	-0.65
Price, Choi & Vinokur (2002)		AWB	HCL, depression subscale	1.5	7.5	667	0.00
Price, Choi & Vinokur (2002)		AWB	HCL, depression subscale	1.5	25.5	616	0.00
Shamir (1986)		AWB	DACL	5.5	12	49	-0.13
Wanberg (1995)		CWB	SWLS	2	11	29	-0.30

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.22. Prospective effect sizes for reemployment.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Ali & Avison (1997)	married mothers	AWB	CES-D	-9	9	46	0.16
Ali & Avison (1997)	single mothers	AWB	CES-D	-9	9	43	0.04
Ginexi, Howe & Caplan, (2000)		AWB	CES-D	-2	2	55	0.74
Ginexi, Howe & Caplan, (2000)		AWB	CES-D	-3.5	3.5	42	0.41
Isaksson (1990)		AWB	GHQ	-6	6	23	-0.50
Jackson, Stafford, Banks & Warr (1983)	first cohort early	AWB	GHQ	-4	4	30	0.76
Jackson, Stafford, Banks & Warr (1983)	first cohort late	AWB	GHQ	-7.5	7.5	19	0.50
Jackson, Stafford, Banks & Warr (1983)	second cohort	AWB	GHQ	-8	8	19	0.87
Nordenmark (1999)	instrumental job	AWB	GHQ	-10.5	10.5	134	0.34
Nordenmark (1999)	self-employed	AWB	GHQ	-10.5	10.5	41	0.26
Nordenmark (1999)	stimulating job	AWB	GHQ	-10.5	10.5	280	0.51
Prause & Dooley (2001)	underemployed	AWB	CES-D	-12	12	293	0.10
Prause & Dooley (2001)	unemployed	AWB	CES-D	-12	12	208	0.25
Wiese (2010)		CWB	German Version of the Relationship Assessment Scale (Sander & Böcker, 1993)	-0.5	1	251	-0.27
Wiese (2010)		CWB	German Version of the Relationship Assessment Scale (Sander & Böcker, 1993)	-0.5	2.25	224	-0.09
Wiese (2010)		CWB	German Version of the Relationship Assessment Scale (Sander & Böcker, 1993)	-0.5	7	197	-0.06
Wiese (2010)		AWB	PANAS	-0.5	1	266	-0.02
Wiese (2010)		AWB	PANAS	-0.5	1	266	0.04

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Wiese (2010)		AWB	PANAS	-0.5	2.25	238	0.12
Wiese (2010)		AWB	PANAS	-0.5	2.25	238	0.10
Wiese (2010)		AWB	PANAS	-0.5	7	206	0.08
Wiese (2010)		AWB	PANAS	-0.5	7	205	0.14
Wiese (2010)		CWB	SWLS	-0.5	1	266	-0.13
Wiese (2010)		CWB	SWLS	-0.5	2.25	234	-0.15
Wiese (2010)		CWB	SWLS	-0.5	7	208	0.00
Winefield & Tiggemann (1990)		AWB	Depressive Affect Scale (Rosenberg, 1965)	-6	6	40	0.20
Winefield & Tiggemann (1990)		AWB	Self-constructed scale	-6	6	40	0.13

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.23. Post-hoc effect sizes for reemployment.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Boswell, Shipp, Payne & Culbertson (2009)		CWB	Michigan Organizational Assessment Questionnaire (Cammann et al., 1979)	3	6	88	-0.26
Boswell, Shipp, Payne & Culbertson (2009)		CWB	Michigan Organizational Assessment Questionnaire (Cammann et al., 1979)	3	12	88	-0.20

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.24. Prospective effect sizes for retirement.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
De Vaus, Wells, Kendig & Quine (2007)		CWB	DAS	-0.25	12	265	0.07
De Vaus, Wells, Kendig & Quine (2007)		CWB	DAS	-0.25	36	263	0.06
De Vaus, Wells, Kendig & Quine (2007)		CWB	Life Satisfaction (Campbell, Converse, & Rodgers, 1976)	-0.25	12	345	-0.26
De Vaus, Wells, Kendig & Quine (2007)		CWB	Life Satisfaction (Campbell, Converse, & Rodgers, 1976)	-0.25	36	348	-0.27
De Vaus, Wells, Kendig & Quine (2007)		AWB	Scale by Lawton et al. (1992)	-0.25	12	345	0.05
De Vaus, Wells, Kendig & Quine (2007)		AWB	Scale by Lawton et al. (1992)	-0.25	12	345	0.53
De Vaus, Wells, Kendig & Quine (2007)		AWB	Scale by Lawton et al. (1992)	-0.25	36	348	-0.01
De Vaus, Wells, Kendig & Quine (2007)		AWB	Scale by Lawton et al. (1992)	-0.25	36	348	0.38
Gall, Evans & Howard (1997)		CWB	Single Item	-3	12	117	0.15
Isaksson & Johansson (2000)		AWB	GHQ-12	-9	9	226	0.06
Kim & Moen (2002)		AWB	CES-D	-9	15	78	0.11
Kim & Moen (2002)		CWB	Single Item	-9	15	75	-1.47
Mayring (2000)		CWB	Scale by Buchmüller et al. (1996)	-6	6	463	-0.02
Mayring (2000)		AWB	Scale by Buchmüller et al. (1996)	-6	6	462	-0.03
Mayring (2000)		CWB	Scale by Buchmüller et al. (1996)	-6	18	462	-0.07
Mayring (2000)		AWB	Scale by Buchmüller et al. (1996)	-6	18	461	-0.06
Nordenmark (1999)		AWB	GHQ	-10.5	10.5	32	0.22
Nuttman-Shwartz (2004)		AWB	MHI, subscale	-6	12	52	0.15
Nuttman-Shwartz (2004)		AWB	MHI, subscale	-6	12	52	0.28

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Pinquart & Schindler (2007)		CWB	Single Item	-6	6	1456	0.07
Pinquart & Schindler (2007)		CWB	Single Item	-6	18	1456	0.06
Pinquart & Schindler (2007)		CWB	Single Item	-6	30	1456	0.06
Pinquart & Schindler (2007)		CWB	Single Item	-6	42	1456	0.03
Pinquart & Schindler (2007)		CWB	Single Item	-6	54	1456	0.02
Pinquart & Schindler (2007)		CWB	Single Item	-6	66	1456	0.09
Poitrenaud, Vallery-Masson, Costagliola, Darcet & Lion (1983)		CWB	Life Satisfaction Index-A (Neugarten et al., 1961)	-18	18	105	0.24
Reitzes, Mutran & Fernandez (1996)		AWB	CES-D	-12	12	291	0.23
Richardson & Kilty (1991)		(missing)	Self-constructed scale	-1	6	242	-0.25
Richardson & Kilty (1991)		(missing)	Self-constructed scale	-1	12	222	-0.16
Wang (2007)	sample 1	AWB	CES-D, short version	-12	12	994	-0.52
Wang (2007)	sample 1	AWB	CES-D, short version	-12	36	905	-0.47
Wang (2007)	sample 1	AWB	CES-D, short version	-12	48	881	-0.60
Wang (2007)	sample 2	AWB	CES-D, short version	-12	12	1066	-0.07
Wang (2007)	sample 2	AWB	CES-D, short version	-12	36	958	-0.19
Wang (2007)	sample 2	AWB	CES-D, short version	-12	48	923	-0.21

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.25. Post-hoc effect sizes for retirement.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Stephan, Bilard, Ninot & Delignières (2003)		AWB	GHQ	2	5	16	0.46
Stephan, Bilard, Ninot & Delignières (2003)		AWB	GHQ	2	8	16	0.59
Stephan, Bilard, Ninot & Delignières (2003)		AWB	GHQ	2	11.5	16	1.24

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.26. Prospective effect sizes for other occupational transitions.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Buddeberg-Fischer, Klaghofer, Stamm, Siegrist & Buddeberg (2008)	men	CWB	Fragebogen zu Lebenszufriedenheit (FLZ; Henrich et al., 2000)	-12	12	235	-0.05
Buddeberg-Fischer, Klaghofer, Stamm, Siegrist & Buddeberg (2008)	men	AWB	Single item	-12	12	235	-0.22
Buddeberg-Fischer, Klaghofer, Stamm, Siegrist & Buddeberg (2008)	women	CWB	Fragebogen zu Lebenszufriedenheit (FLZ; Henrich et al., 2000)	-12	12	280	-0.17
Buddeberg-Fischer, Klaghofer, Stamm, Siegrist & Buddeberg (2008)	women	AWB	Single item	-12	12	280	-0.03
Buhl (2007)		AWB	Self-constructed scale	-12	36	51	0.33
Dockery (2005)		AWB	Single item	-6	6	7401	0.01
Dockery (2005)		AWB	Single item	-6	18	6713	0.04
Dockery (2005)		AWB	Single item	-6	30	5909	0.06
Dockery (2005)		AWB	Single item	-6	42	5273	0.05
Donovan, Oddy, Pardoe & Ades (1986)	female	AWB	GHQ	-2	7	16	0.53
Donovan, Oddy, Pardoe & Ades (1986)	female	AWB	GHQ	-2	7	14	0.11
Donovan, Oddy, Pardoe & Ades (1986)	male	AWB	GHQ	-2	7	29	0.56
Donovan, Oddy, Pardoe & Ades (1986)	male	AWB	GHQ	-2	7	27	0.31
Gore, Aseltine, Colten & Lin (1997)	commuter college	AWB	CES-D	-18	18	225	0.12
Gore, Aseltine, Colten & Lin (1997)	commuter college	AWB	CES-D	-18	18	108	0.04
Gore, Aseltine, Colten & Lin (1997)	residential college	AWB	CES-D	-18	18	387	0.20
Gore, Aseltine, Colten & Lin (1997)	residential college	AWB	CES-D	-18	18	189	0.35
Lee & Gramotnev (2007)		AWB	CES-D	-18	18	1220	0.19
Lee & Gramotnev (2007)		AWB	CES-D	-18	18	474	0.17
Lee & Gramotnev (2007)		AWB	CES-D	-18	18	946	0.12

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Lee & Gramotnev (2007)		CWB	Self-constructed scale	-18	18	1220	0.41
Lee & Gramotnev (2007)		CWB	Self-constructed scale	-18	18	474	0.26
Lee & Gramotnev (2007)		CWB	Self-constructed scale	-18	18	946	0.47
Levitt, Silver & Santos (2007)		CWB	Relationship Satisfaction Scale (Levitt et al., 1994)	-9	15	138	-0.03
Levitt, Silver & Santos (2007)		CWB	Relationship Satisfaction Scale (Levitt et al., 1994)	-9	15	138	0.15
Mesch, McGrew, Pescosolido & Haugh (1999)		AWB	CES-D	-1	8	85	-0.52
Mesch, McGrew, Pescosolido & Haugh (1999)		CWB	Self-constructed scale	-1	8	85	0.10
Mesch, McGrew, Pescosolido & Haugh (1999)		CWB	Single item	-1	8	85	-0.21
Nordenmark (1999)	parental leave	AWB	GHQ	-10.5	10.5	33	0.33
Nordenmark (1999)	sick-listed	AWB	GHQ	-10.5	10.5	21	-0.25
Nordenmark (1999)	students	AWB	GHQ	-10.5	10.5	145	0.36
Ripoll, Caballer, Martinez-Tur, Garcia-Buadez & Peiro (1998)		CWB	Single item	-7.5	7.5	69	0.21
Schonfeld (2001)		AWB	CES-D	-3	3	184	-0.09
Schonfeld (2001)		AWB	CES-D	-3	9	184	-0.01
Silver (1996)		AWB	ABS	-6	24	78	-0.09
Vanlede, Little & Card (2006)		AWB	Children's Depression Inventory (Kovacs, 1985)	-3	3	368	0.01
Vanlede, Little & Card (2006)		AWB	Inventory of Felt Emotion and Energy in Life (IFEEL; Little, Ryan, & Wanner, 1997), sub-scale	-3	3	368	0.02

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Vanlede, Little & Card (2006)		AWB	Inventory of Felt Emotion and Energy in Life (IFEEL; Little, Ryan, & Wanner, 1997), sub-scale	-3	3	368	0.03
Virtanen & Koivisto (2001)	graduation in 1995	AWB	GHQ	-6	6	174	0.39
Virtanen & Koivisto (2001)	graduation in 1995	AWB	GHQ	-6	18	173	0.31
Virtanen & Koivisto (2001)	graduation in 1995	AWB	GHQ	-6	42	173	0.44
Virtanen & Koivisto (2001)	graduation in 1996	AWB	GHQ	-18	6	136	0.18
Virtanen & Koivisto (2001)	graduation in 1996	AWB	GHQ	-18	30	136	0.33

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.27. Post-hoc effect sizes for other occupational transitions.

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Chan (1999)		CWB	Self-constructed scale	1	2	146	0.03
Chan (1999)		CWB	Self-constructed scale	1	3	146	0.05
Chan (1999)		CWB	Self-constructed scale	1	4	146	0.22
Gillison, Standage & Skevington (2008)		AWB	KIDSCREEN (Ravens-Sieberer et al., 2005) subscale	0.25	0.75	63	0.29
Gillison, Standage & Skevington (2008)		(missing)	KIDSCREEN (Ravens-Sieberer et al., 2005) subscale	0.25	0.75	63	0.08

Publication	Group	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Gillison, Standage & Skevington (2008)		AWB	KIDSCREEN (Ravens-Sieberer et al., 2005) subscale	0.25	2.5	63	-0.06
Gillison, Standage & Skevington (2008)		(missing)	KIDSCREEN (Ravens-Sieberer et al., 2005) subscale	0.25	2.5	63	0.45
Lopez (2001)		AWB	GWB	1	8	54	0.86
Meyer & Allen (1988)		CWB	Self-constructed scale	1	6	73	-0.43
Meyer & Allen (1988)		CWB	Self-constructed scale	1	11	73	-0.48
Pritchard & McIntosh (2003)		AWB	CES-D	0.2	9	89	-0.64
Pritchard & McIntosh (2003)		AWB	PANAS, NA	0.2	9	89	-0.35
Pritchard & McIntosh (2003)		AWB	PANAS, PA	0.2	9	89	-0.93
Pulakos & Schmitt (1983)		CWB	Minnesota Satisfaction Questionnaire (Weiss et al., 1967)	9	20	321	-0.12
Pulakos & Schmitt (1983)		CWB	Minnesota Satisfaction Questionnaire (Weiss et al., 1967)	9	20	321	0.13
Schonfeld (2001)		CWB	Job Satisfaction Scale (Quinn & Staines, 1979)	3	9	184	-0.21
Sheldon & Krieger (2007)		AWB	Composite score	0	28.5	200	-0.57

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.28. Prospective effect sizes for relocation/migration.

Publication	Event	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Bardi & Ryff (2007)	Relocation	AWB	CES-D	-6	2	294	0.26
Bardi & Ryff (2007)	Relocation	AWB	CES-D	-6	8	286	0.42
Bardi & Ryff (2007)	Relocation	AWB	CES-D	-6	15	298	0.30
Lee & Gramotnev (2007)	Relocation	AWB	CES-D	-18	18	1262	0.14
Lee & Gramotnev (2007)	Relocation	AWB	CES-D	-18	18	172	0.18

Publication	Event	AWB/CWB	Scale	Time lag	Months since event	*N*	*d*
Lee & Gramotnev (2007)	Relocation	CWB	Self-constructed scale	-18	18	1262	0.48
Lee & Gramotnev (2007)	Relocation	CWB	Self-constructed scale	-18	18	172	0.35
Munton & West (1995)	Relocation	AWB	GHQ	-1	3	119	0.19
Munton & West (1995)	Relocation	AWB	GHQ	-1	6	121	0.38
Rossen & Knafl (2007)	Relocation	AWB	Geriatric Depression Scale (GDS; Brink et al., 1982)	-1	3	30	0.11
Savicki, Downing-Burnette, Heller, Binder & Suntinger (2004)	Migration	CWB	SWLS	-1	1	17	0.22
Savicki, Downing-Burnette, Heller, Binder & Suntinger (2004)	Migration	CWB	SWLS	-1	2	17	0.35
Savicki, Downing-Burnette, Heller, Binder & Suntinger (2004)	Migration	CWB	SWLS	-1	3	17	0.55

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

Table 3.29. Post-hoc effect sizes for relocation/migration.

Publication	Event	Group	AWB/ CWB	Scale	Time lag	Months since event	*N*	*d*
Aroian & Norris (2002)	Migration		AWB	SCL-90-R, depression subscale	20.8	44.8	468	0.05
Bikos et al. (2007)	Migration		CWB	KMS	0.5	3	29	0.05
Bikos et al. (2007)	Migration		CWB	KMS	0.5	6	29	0.06
Bikos et al. (2007)	Migration		CWB	KMS	0.5	9	29	0.12
Bikos et al. (2007)	Migration		CWB	KMS	0.5	12	29	0.05
Chou (2007)	Migration		AWB	GHQ	5	17	359	-0.15
Schmitt-Rodermund & Silbereisen (2002)	Migration	Experienced	AWB	Self-Image Questionnaire for Young Adolescents (Petersen et al., 1984)	31	37	109	0.04

Publication	Event	Group	AWB/ CWB	Scale	Time lag	Months since event	*N*	*d*
Schmitt-Rodermund & Silbereisen (2002)	Migration	Experienced	AWB	Self-Image Questionnaire for Young Adolescents (Petersen et al., 1984)	31	43	108	0.13
Schmitt-Rodermund & Silbereisen (2002)	Migration	Newcomers	AWB	Self-Image Questionnaire for Young Adolescents (Petersen et al., 1984)	16	22	105	0.02
Schmitt-Rodermund & Silbereisen (2002)	Migration	Newcomers	AWB	Self-Image Questionnaire for Young Adolescents (Petersen et al., 1984)	16	28	103	0.16

Notes. AWB = affective well-being. CWB = cognitive well-being. Time lag = time between baseline and event in months. *N* = sample size. *d* = bias-corrected standardized mean change. The abbreviations for the scales are listed in Table 3.9.

4 Does it Really Feel the Same? Changes in Life Satisfaction Following Repeated Life Events

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Abstract

Unemployment, divorce, and marriage are common life events for most people in Western societies. In a longitudinal study, we investigated how these life events affect life satisfaction when they occur repeatedly. Data came from the German Socioeconomic Panel (GSOEP), a large-scale representative panel study, and were analyzed using multilevel modeling. Results showed that in general, life satisfaction decreases with repeated unemployment (sensitization). For repeated divorces, life satisfaction is higher at the second divorce than it had been had the first divorce (adaptation). Finally, life satisfaction is similar at repeated marriages. Neuroticism, extraversion, and gender accounted for interindividual differences in changes in life satisfaction. For instance, the general sensitization pattern associated with repeated unemployment was less pronounced for females. We also found main effects of age and the duration of the first event on general differences in life satisfaction. Finally, those with repeated events generally report lower life satisfaction than those with only one occasion of these events, even before the first event actually occurred. Our findings show that repeated events can have very different effects on life satisfaction that depend on the nature of the event.

Keywords: subjective well-being, repeated life events, adaptation, longitudinal, multilevel modeling, personality, gender differences

Does it Really Feel the Same? Changes in Life Satisfaction Following Repeated Life Events

Get a job. Get a family. Be happy. Most of us would agree that this is what life is all about. But life can take unexpected turns. Jobs can be lost, marriages can fail. Unemployment, divorce and remarriage are common in most western societies and can even occur multiple times in a person's life time. How do these events affect peoples' subjective well-being?

For decades, researchers believed that people would adapt to any events, regardless of how life-transforming they might have been (for overviews, see E. Diener, Lucas, & Scollon, 2006; Frederick & Loewenstein, 1999). For instance, in their classic study, Brickman, Coates, and Janoff-Bulman (1978) found that lottery winners and patients with paraplegia were much more alike in their reported subjective well-being than the authors would have expected, supporting their concept of the hedonic treadmill.

Recent research conducted by Lucas and his colleagues (Lucas, 2007a) has challenged this view. Lucas examined reaction and adaptation to several major life events by applying longitudinal prospective designs. He showed that events such as unemployment (Lucas, Clark, Georgellis, & E. Diener, 2004), widowhood (Lucas, Clark, Georgellis, & E. Diener, 2003), divorce (Lucas, 2005), and disability (Lucas, 2007b) can lead to long-term changes in life satisfaction and concluded that "adaptation is not inevitable" (Lucas, 2007a, p. 77).

However, the evidence gathered by Lucas and his colleagues is limited in that it is exclusively based on adaptation to single life events. Little is known about changes in life satisfaction in the context to *repeated* similar life events. Does unemployment decrease life satisfaction only when it occurs for the first time, or is repeated unemployment associated with repeated descents in life satisfaction? Do we have a stable divorce-specific level of life satisfaction or can life satisfaction at the second divorce differ from life satisfaction at the first divorce? And finally, are weddings always associated with a "boost" in life satisfaction (Lucas et al., 2003), regardless of whether someone gets married for the first or for the second time? These are some of the questions we will try to answer in this paper.

4.1 Explaining Changes in the Impact of an Event

If the level of life satisfaction at a later occasion of an event differs from its first occasion, this indicates that the *impact of this event* on life satisfaction has changed. In this section, we discuss the possible patterns of change and the underlying processes that determine the impact of an event.

4.1.1 Patterns of Changes

When comparing the impact of different occasions of similar events on life satisfaction, three general patterns are possible: (1) The impact of later events is similar to the impact of the first event. For instance, couples who become parents for the second time hopefully will be just as happy as they had been when their first baby was born. (2) The impact of later events is stronger than the impact of the first event. For instance, experiencing the death of a close one for the second time in life might lead to a much greater decrease in life satisfaction than it had the first time. (3) The impact of later events is weaker than the impact of the first event. For instance, individuals who have coped well when struck by a serious illness might retain a high level of life satisfaction when they fall ill again.

The first pattern is consistent with various lines of research. Several authors emphasize the impact of stable factors on subjective well-being, for example, genetic factors (Lykken & Tellegen, 1996) or personality traits (Costa & McCrae, 1987; Headey & Wearing, 1989). If life satisfaction is mainly determined by stable factors, then its level should be similar each time a specific event occurs. Alternatively, this kind of pattern can also be explained by a more general theory, namely Mischel and Shoda's (1995) notion of situation-behavior relations. They predict that in specific situations, an individual will consistently show the same behavior (if … then … relations). According to this view, behavior may vary between different situations, but it should be rather stable within similar situations.

The second pattern corresponds to a *sensitization* pattern. Sensitization has previously been described in the stress-sensitization model (Mazure, 1998; Monroe & Harkness, 2005; Post, 1992), a variant of the diathesis-stress model of depression. This model predicts that frequent exposure to negative events leads to a higher risk for affective disorders (Kessing, Agerbo, & Mortensen, 2003). The stress-sensitization model has been supported empirically by various studies, most of them focusing on adverse events during childhood such as abuse or parental divorce (e. g., Dienes, Hammen, Henry, Cohen, & Daley, 2006; Hammen, Henry, & Daley, 2000; Harkness, Bruce, & Lumley, 2006; Rudolph & Flynn, 2007). Although this term has originally been used in the context of negative events, it can easily be applied to positive events. Here, sensitization would mean that someone becomes more responsive towards the positive aspects of an event.

The third pattern corresponds to an *adaptation* pattern. Adaptation has been defined as a process that "reduces the effects […] of a constant or *repeated* [italics added] stimulus" (Frederick & Loewenstein, 1999, p. 302). In the context of negative events, several related concepts have been proposed, including psychological immunization (Henderson, 1994), learned resourcefulness (Rosenbaum, 1990), learned optimism (Seligman, 1991), steeling effect of adversity (Chorpita & Barlow, 1998), resilience (Bonanno, 2004), and stress-inoculation (Rudolph & Flynn, 2007). The common idea of these concepts is that negative life events do not inevitably decrease subjective well-being or even trigger psychiatric disor-

ders, but rather most people seem to handle adversity quite well. Moreover, experiencing adverse events can facilitate the development of adequate coping strategies that buffer the impact of future adversity.

The concepts of sensitization and adaptation can be applied to both positive and negative events. However, research on positive events is much scarcer and it is therefore harder to find studies that refer to the repeated exposure to positive events. This is partly due to the exclusive focus on defects and adversity that has characterized psychology for a long time. We hope that the newly emerged field of positive psychology (Seligman & Csikszentmihalyi, 2000) will fill this gap.

4.1.2 Differential Reaction vs. Accumulation

We assume that the impact of a repeated event has changed if we observe different levels of life satisfaction at the two occasions. This effect can be caused by short-term processes as well as by long-term processes. First, the reaction to the second event might differ from the reaction to the first event, that is, the short-term decrease or increase in life satisfaction will be greater. Second, factors increasing or decreasing life satisfaction might accumulate over time and thereby alter the level of life satisfaction not only at the occurrence of the event itself, but also before the event. In this case, the reaction to the event might be the same, but the pre-event level of life satisfaction will be different due to long-term processes that affect life satisfaction. These processes of *differential reaction* and *accumulation* are not exclusive, but they can occur combined.

4.2 Previous Research on Repeated Life Events

Previous research on repeated life events can be classified into two groups. The first group comprises studies that are based on intensity or frequency measures of life events (e. g., Holmes & Rahe, 1967) which do not further distinguish between the events. These studies were mostly cross-sectional. For instance, they compared individuals having experienced multiple stressful life events with individuals having experienced few or no stressful events (e. g., Tsakanikos, Bouras, & Costello, 2007), or they related the frequency of life events to an outcome variable (e. g., McCullough, Huebner, & Laughlin, 2000; Vinokur & Caplan, 1986). Longitudinal studies in this group typically tried to predict changes in life satisfaction between two measurement occasions by the number of events that have happened between these measurement occasions (e. g., Suh, E. Diener, & Fujita, 1996). They did not analyze the adaptation to the single events within the period of time considered.

The second group comprises cross-sectional and longitudinal studies that focus on specific life events. In cross-sectional studies, individuals having experienced the event multiple times were compared to

individuals having experienced the event only once or not at all (e. g., Cargan & Whitehurst, 1990). In longitudinal studies, intraindividual change after a specific event was analyzed, and previous experiences were included in order to account for interindividual differences in intraindividual change (e. g., Lucas et al., 2004). However, these studies did not analyze the patterns of change due to *repeated* experiences of the same event as they did not measure life satisfaction before and after the different events. Adaptation to repeated events can only be analyzed if life satisfaction has been assessed repeatedly over a time period in which repeated events occurred. To our knowledge, such a study is still missing, and the aim of this paper is to fill this important gap.

In the present paper, we will examine changes in life satisfaction in the context of repeated unemployment, repeated divorces, and repeated marriages. We chose these events for three reasons: (a) These events can occur repeatedly because they are associated with a reversible change in employment or marital status—in contrast to an event such as disability. (b) From previous studies, we already have some knowledge about how people react and adapt to single occasions of these events. (c) Data on these events are attainable from large-scale panel studies, for instance from the German Socioeconomic Panel (GSOEP; Wagner, Frick, & Schupp, 2007). In the following section, we will summarize the literature on repeated unemployment, repeated divorces, and repeated marriages.

4.2.1 Unemployment

From a series of cross-sectional and longitudinal studies, we know that unemployment is usually associated with lower life satisfaction (Argyle, 1999, 2001; see McKee-Ryan, Song, Wanberg, & Kinicki, 2005 for a meta-analysis). This is probably due to the accumulation of stress factors typically associated with unemployment (Warr, 1987). It has also been shown that the negative effects of unemployment endure, even when the person is reemployed (Clark, Georgellis, & Sanfey, 2001; Lucas et al., 2004).

We do not know much about the impact of *repeated* experiences of unemployment on life satisfaction. According to the stress accumulation hypothesis mentioned above, life satisfaction should decrease with each new unemployment experience. However, there are only few studies on repeated unemployment, with contradicting results. Analyzing data from the GSOEP, Clark et al. (2001), Lucas et al. (2004), and Winkelmann and Winkelmann (1998) found that individuals with previous unemployment experience report lower life satisfaction scores than do individuals who have never been unemployed before. This effect was found during reemployment as well as during subsequent unemployment, supporting the notion that the negative impact of unemployment becomes stronger over time. However, these studies only examined previous unemployment as a predictor of interindividual difference. They did not examine life satisfaction over the course of repeated unemployment periods, which is a precondition for detecting patterns of changes in life satisfaction.

Isaksson (1990)opposed the stress accumulation hypothesis and proposed that the experience of frequent job loss should lead to a weaker negative reaction and to faster adaptation to subsequent unemployment because the frequently unemployed accept being unemployed as a part of their lives. Isaksson found some support for his hypothesis in a longitudinal study on disadvantaged workers whose psychological well-being had been assessed during a period of unemployment and in a 1-year follow-up. Those who were unemployed at both occasions, but had been reemployed sometime in between, reported no differences in psychological well-being.

In sum, previous studies on unemployment revealed some important insights into the process of adaptation to the experience of unemployment. With respect to *repeated* unemployment, however, little is known about potential changes in life satisfaction.

4.2.2 Marital Status and Marital Transitions

Marital status is a significant correlate of life satisfaction. Married individuals consistently report higher levels of life satisfaction than unmarried individuals (e. g., E. Diener, Gohm, Suh, & Oishi, 2000; M. L. Diener & Diener McGavran, 2008; Inglehart, 1990; Peiró, 2006). Among the unmarried, those who are divorced or widowed are the least satisfied (Argyle, 1999).

Few studies have examined *repeated divorces*, but they generally support the notion that individuals who have divorced several times are less satisfied with their lives than others, even if they remarry. After reviewing the literature, Brody, Neubaum, and Forehand (1988) suggested that repeated divorces have a cumulative effect on subjective well-being, as feelings about personal failure are reinforced with each new divorce. Likewise, Spanier and Furstenberg (1982) assumed that whereas remarriage enhances psychological adjustment, redivorce intensifies the negative feelings experienced during the first divorce. Empirical support stems from cross-sectional studies conducted in the late 1980's. Kurdek (1991) and Cargan and Whitehurst (1990) found higher degrees of depression, psychological distress, and alcohol consumption among multiply-divorced individuals compared with once-divorced individuals. However, no differences in happiness or life satisfaction could be detected (Cargan & Whitehurst, 1990; Kurdek, 1991; McCranie & Kahan, 1986).

Concerning *repeated marriages*, the empirical results are mixed. Weingarten (1980) found that remarried females are happier than first married females, whereas there were no differences between first-married and remarried males. By contrast, in a longitudinal study conducted by Erbes and Hedderson (1984), first-married males scored higher on psychological well-being than remarried males across all waves. Finally, Glenn (1981) and Evans and Kelley (2004) found no substantial differences between first-married and remarried individuals.

Overall, the studies presented above suggest that it does make a difference whether people experience a specific marital transition for the first or the second time in life. However, the findings are ambiguous and cannot give a definite answer on whether repeated marriages and repeated divorces are associated with differential changes in life satisfaction.

4.2.3 Interindividual Differences

In their revision of the classic set point theory, E. Diener et al. (2006) pointed out that people differ substantially in their reaction and adaptation to major life events. Previous studies have aimed at explaining these interindividual differences with demographic, personality, and contextual variables (for an overview, see Eid & Larsen, 2008).

Demographic Variables

Gender is the demographic variable that has by far received the most attention. Regarding unemployment, the impact of work status on reputation and self-esteem is traditionally higher for males than for females in most Western cultures (Carroll, 2007). This implies that unemployment has worse consequences for men than for women. This might change, though, as the importance of being employed is increasing among females. In fact, in their meta-analysis, McKee-Ryan et al. (2005) found that females are slightly less satisfied with their lives during unemployment than males.

Concerning divorce, some authors concluded that males cope better than females. Divorced males are more likely to go out regularly and to start dating and having romantic relationships sooner (Cargan & Whitehurst, 1990). Females, by contrast, are more likely to end up as single-parents, which can be a source of stress (Horwitz, White, & Howell-White, 1996), but also a source of support (Kalmijn, 2007). However, there is also some evidence that divorce might have worse consequences for males. For instance, females usually have more extra-marital relationships providing social support after stressful life events (Cargan & Whitehurst, 1990). Furthermore, they are more likely to initiate divorce (Hewitt, Western, & Baxter, 2006), to see more positive consequences of divorce (Bevvino & Sharkin, 2003), and to be satisfied with divorce settlements (Sheets & Braver, 1996) than males. Finally, there are studies where no gender differences in reaction and adaptation to divorce could be detected (e. g., Williams, 2003).

The picture is equally blurred for marriage. For a couple of decades, most researchers agreed that males benefit more from being married than females (e. g., Gove, Style, & Hughes, 1990; Waite, 1995). This was supported in a meta-analysis on marital satisfaction (Vemer, Coleman, Ganong, & H. Cooper, 1989). However, other studies report higher benefits for females (Wood, Rhodes, & Whelan, 1989) or no gender differences at all (Lucas et al., 2003; Williams, 2003).

In sum, there is evidence for gender differences in reaction to life events, but the results were inconsistent for both unemployment and marital transitions. Moreover, there are no studies that have directly examined the impact of gender on the reactions to repeated events.

Personality

Neuroticism and, to a somewhat lesser degree, extraversion are both associated with subjective well-being (Costa & McCrae, 1980; DeNeve & Harris Cooper, 1998; Lucas & Fujita, 2000; Steel, Schmidt, & Shultz, 2008; Vittersø, 2001). In general, individuals high in extraversion are more likely to experience positive affect. Individuals high in neuroticism, on the other hand, are more likely to experience negative affect (Larsen & Ketelaar, 1991). Extraversion and neuroticism have also been related to major life events. Specifically, neurotics are more likely to experience negative life events, whereas extraverts are more likely to experience positive life events (Headey & Wearing, 1989; Magnus, E. Diener, Fujita, & Pavot, 1993).

Moreover, extraversion and neuroticism moderate the adaptation to major life events. Individuals low in extraversion and high in neuroticism tend to choose ineffective coping strategies, thereby inhibiting a fast adaptation to negative events (see Diener et al., 2006, for an overview). This effect has been supported for unemployment (Argyle, 2001; Payne, 1988). Concerning marital status, various studies have shown that marital problems and divorce are associated with nonconforming, impulsive, and stimulus-seeking personality traits (McCranie & Kahan, 1986), high extraversion (Cramer, 1993), and high neuroticism (Caughlin, Huston, & Houts, 2000; Cramer, 1993; Rogge, Bradbury, Hahlweg, Engl, & Thurmaier, 2006). However, surprisingly little is known about how these personality traits influence adaptation to marital transitions. Moreover, we do not know whether extraversion and neuroticism moderate the reaction and adaptation to repeated life events.

Contextual Variables

Various studies have shown that the duration of a specific status affects how strongly people react and how fast they adapt to it, including studies on unemployment (McKee-Ryan et al., 2005) and marital status (Evans & Kelley, 2004; Weingarten, 1980). Again, we do not know much about the influence of the duration of an event when repeated events are considered.

4.2.4 Summary

Previous research on repeated life events has detected some interesting effects. For both unemployment and divorce, repeated experiences of these events seem to affect life satisfaction differently than do single experiences. Specifically, repeated negative events seem to be associated with decreased life satisfaction, whereas repeated positive events do not seem to affect life satisfaction substantially. Con-

cerning moderator variables, previous research has focused on explaining interindividual differences in the reaction and adaptation to single life events. However, we do not know how variables such as gender and personality moderate reaction and adaptation to repeated life events.

4.3 Aims of the Present Research

In order to better understand adaptation processes, we need to know more about the patterns of changes in life satisfaction associated with repeated events, and about the variables that account for interindividual differences in the reactions to repeated events. Our literature review has revealed several missing links and open questions with respect to the influence of repeated similar life events on life satisfaction. In particular, none of the cited studies on repeated life events comprised enough measurement occasions to analyze the changes in life satisfaction associated with these repeated events directly. In order to examine the impact of repeated events on life satisfaction, studies with multiple measurements before and after the occurrence of the events are needed.

In the present paper, we aim at answering two main questions that have emerged in our review:

1. How does the level of life satisfaction change in association with repeated unemployment, repeated divorces, and repeated marriages?
2. Are there interindividual differences in these changes, and if so, how can these differences be explained?

In order to properly address these questions, we will extend previous research on repeated life events in several substantive and methodological aspects. First, we will apply a longitudinal and prospective design which allows examining the influence of previous experiences on the reaction and adaptation to repeated life events directly by comparing life satisfaction at Event 1 to life satisfaction at Event 2. This allows us to analyze average changes in life satisfaction in the context of repeated events as well as individual differences in these changes. Although some of the studies presented above were longitudinal in nature (e. g., Erbes & Hedderson, 1984; Isaksson, 1990; Lucas et al., 2003, 2004), none of them examined repeated life events directly.

Second, we will use data from a representative sample that allows us to detect the typical change pattern. Finally, we will analyze interindividual differences in the reactions to repeated events and scrutinize whether results from studies on single events can be generalized to repeated events. We are interested in demographic, personality, and contextual variables and therefore will include gender and age (as demographic variables), extraversion and neuroticism (as personality variables), and the duration of the first event (as a contextual variable) in our analyses.

4.4 Method

4.4.1 Sample

We used 24 waves from the German Socioeconomic Panel (GSOEP; Wagner et al., 2007), a large representative survey of German households that has been conducted annually since its first implementation in 1984. 12,245 individuals participated in the first wave. Over the years, the sample was extended with several refreshment samples; for instance in 1990, 4453 East Germans joined the survey. Attrition rate is low, so longitudinal data are available for a large number of individuals. The main focus of the survey is on social indicator variables such as income, job features, and family structure. Information on marital status and employment is available for each wave. Another major variable in the GSOEP is life satisfaction which is also assessed annually.

Data from the GSOEP have been used by other research groups interested in life events and life satisfaction (e. g., Headey, 2008; Lucas et al., 2003, 2004). However, this data set has not yet been analyzed with respect to the reaction to repeated life events.

For each event, we considered subsamples from the total sample. These subsamples only included individuals who had experienced the event at least once during data collection, but not before data collection. In addition, we excluded individuals with no data on personality, which was only assessed in 2005 (wave 22). The unemployment subsample size was $N = 3350$ persons including 787 persons (23.5 %) with at least two unemployment periods. The divorce subsample size was $N = 921$ including 74 persons (8.0 %) with at least two divorces. Finally, the size of the marriage subsample was $N = 1950$ individuals including 116 persons (5.9 %) with at least two marriages.

The subsamples for repeated divorce and repeated marriage overlapped slightly; 222 individuals were included in both samples. Only 13 of them had experienced both repeated marriages and repeated divorces during the data collection. Therefore, it was not possible to analyze these related events in a single study. Table 4.1 provides descriptive statistics for each subsample as well as for all participants in the GSOEP who provided data on personality.

Table 4.1. Descriptive statistics for level-2 variables in the total sample and in the three subsamples

	Total sample [a]		Subsample unemployment [b]		Subsample divorce[c]		Subsample marriages [d]	
	M	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
Gender (1 = female)	0.52	0.50	0.49	0.50	0.53	0.50	0.51	0.50
Year of birth	1957.67	17.55	1962.87	14.88	1959.42	10.37	1969.18	7.38
Extraversion	4.83	1.14	4.84	1.13	4.93	1.13	4.92	1.14
Neuroticism	3.96	1.22	4.06	1.18	4.04	1.22	3.92	1.18
Age at first event	[e]	[e]	35.71	13.70	38.55	9.89	28.82	6.40
Duration of first event	[e]	[e]	2.32	1.99	5.83	4.62	8.92	5.73

Note. Life satisfaction was centered on the mean of the total sample within each wave. Extraversion and neuroticism range from 1 (*low*) to 7 (*high*).

[a] Listwise deletion, $N = 20831$. [b] $N = 3350$. [c] $N = 921$. [d] $N = 1950$. [e] Data cannot be calculated for the total sample.

4.4.2 Measures

The data had a multilevel structure with measurement occasions (level-1) nested within individuals (level-2).

Level-1 Variables

Life satisfaction was assessed annually with a single question ("How satisfied are you with your life, all things considered?"). Participants rated their life satisfaction on an 11-point scale ranging from 0 (*completely dissatisfied*) to 10 (*completely satisfied*). Mean life satisfaction scores in the total sample ranged from 6.77 (wave 21) to 7.39 (wave 1). Standard deviations ranged from 1.74 (wave 18) to 2.14 (wave 1). In order to control for variation in overall life satisfaction due to historical events (e.g., fall of the Berlin wall), we centered the scores on the means for the total sample within each wave. These means were obtained from Frick (2008).

Data on event occurrence were derived from annual spell data on marital and employment status. These data provide information on when a specific status began and when it ended. Unemployment spells relied on the information whether an individual was officially registered as unemployed sometime during a specific year. Thus, unemployment is not equivalent to not working (e.g., as a homemaker). Rather, these individuals were unemployed involuntarily and registered as seeking employment. Spell data on marital status were derived from retrospective as well as from annual information on marital status (for detailed information on GSOEP spell data, see Frick & Groh-Samberg, 2006).

Level-2 Variables

Extraversion and neuroticism were assessed with two subscales from the BFI-S (Gerlitz & Schupp, 2005), which is a shorter and translated version of the Big Five Inventory (John, Donahue, & Kentle, 1991) and has been developed explicitly for the GSOEP. Each subscale consists of three items which are rated on a 7-point scale ranging from 1 (*does not apply to me at all*) to 7 (*applies to me perfectly*). Scores for the subscales were obtained by calculating the mean of the three items. Although the internal consistencies of the subscales are rather low (α = .59 for neuroticism and α = .62 for extraversion; Gerlitz & Schupp, 2005, p. 21), the BFI-S replicates longer validated scales (Gerlitz & Schupp, 2005). Neuroticism and extraversion were both grand-mean centered.

Our subsamples comprised individuals who had experienced the event at least once. However, we are particularly interested in those who have experienced repeated events. In order to examine differences between this particular group and those with only one experience, we included this information as a dummy variable (1 = single event, 0 = repeated events).

We further included gender, age at the first event, and duration of the first event (e.g., duration of first unemployment period) as level-2 variables. These variables were all grand-mean centered except for gender which was dummy-coded (1 = females, 0 = males).

4.4.3 Analytic Technique

Data were analyzed with multilevel regression models using the Hierarchical Linear and Nonlinear Modeling (HLM) software, Version 6.03 (Raudenbush, Bryk, & Congdon, 2005). Like most large scale panel studies, the GSOEP provides unbalanced data sets and unequally spaced measurement occasions. Multilevel models can handle this kind of longitudinal data. In multilevel models, intraindividual change is modeled on level-1 using time-varying variables. Interindividual differences in change are modeled by time-invariant variables on level-2.

Level-1 and level-2 models were built stepwise and separately for each event (Singer & Willett, 2003). In Step 1, we modeled changes in life satisfaction in a simple model containing only level-1 and no level-2 variables. In Step 2, the initial model was extended by including level-2 variables to explain individual differences in the changes in life satisfaction.

Simple Model

In the simple model, we adapted and extended the approach used by Lucas et al. (2003) in their studies on the reaction and adaptation to marriage and widowhood. In their analyses, they applied a discontinuous change model where the different time periods were represented by dummy-coded time variables. Specifically, they introduced three time periods: a reaction period, an adaptation period, and a

baseline period. In the reaction period, the year before a specific event, the year of the event itself, and the years following the event were all coded with ones. The other years were coded with zeros. The adaptation period was coded with ones on all years following the reaction period and zeros on all other years. The baseline period included all years preceding the reaction phase. This time period was not coded as a separate variable. Instead, it was taken as a reference time period against which the coefficients of the other time periods were tested.

We extended this model in several aspects in order to consider repeated events. First, we added variables representing subsequent time periods such as the time after the first event, the time period of the second event, and so forth. Consistent with Lucas et al. (2003), each time period was represented by a separate dummy-coded variable. Second, we chose a different time period as a reference time period. In the Lucas et al. models, average life satisfaction before the event was used as a reference to which the coefficients of the other time periods were compared. In our models, by contrast, the occasion of the first event was taken as a reference time period with zeros on all variables. The years before the first event were included as a dummy coded variable (baseline).

In multilevel longitudinal models, it is assumed that the level-1 residuals are uncorrelated. This assumption is generally not met in longitudinal models, but rather, one can usually find an autoregressive structure among the residuals (Goldstein, Healy, & Rasbash, 1994; Rovine & Walls, 2006). We accounted for this by controlling for autoregressive trends in life satisfaction. Specifically, we included an autoregressive parameter in our models so that life satisfaction in a specific wave t was predicted by life satisfaction in wave $t - 1$.

As no autoregressive value can be calculated for the first wave of participation, we omitted the first wave for each participant. The autoregressive parameter was grand-mean centered. The coefficients of the time variables can therefore be interpreted as the predicted effects for individuals with an average autoregressive parameter (reference group).

For the example of repeated unemployment, the simple level-1 model can be formalized as

$$LS_{ti} = \pi_{0i} + \pi_{1i}(BASE_{ti}) + \pi_{2i}(RE1_{ti}) + \pi_{3i}(UE2_{ti}) + \pi_{4i}(RE2_{ti}) + \pi_{5i}(UE3_{ti}) + \pi_{6i}(RE3_{ti}) + \pi_{7i}(LS_{(t-1)i}) + e_{ti}$$

where LS_{ti} denotes the observed life satisfaction of an individual i at occasion t, $BASE_{ti}$ is the dummy-coded variable indicating the years before the first unemployment (baseline), $UE1_{ti}$ to $UE3_{ti}$ are the dummy-coded variables indicating Unemployment 1 to Unemployment 3, $RE1_{ti}$ to $RE3_{ti}$ are the

dummy-coded variables indicating Reemployment 1 to Reemployment 3, $LS_{(t-1)i}$ indicates the grand-mean centered autoregressive parameter, and e_{ti} indicates the level-1 random effect.

To clarify the meaning of the coefficients in the simple level-1 model, we illustrate the coding of the time periods and the change patterns for the example of repeated unemployment in Figure 4.1. The coefficient π_{0i} represents the life satisfaction score of individual *i* during the first unemployment period (UE 1). This period serves as the reference time period. Life satisfaction was centered on the means of the total sample within each wave. Therefore, a non-zero coefficient π_{0i} indicates that life satisfaction in the subsample during this time period is significantly different from life satisfaction in the total sample.

The coefficients π_{3i} and π_{5i} represent the contrasts between life satisfaction at the later unemployment periods (UE 2, UE 3) and life satisfaction at Unemployment 1, respectively. For instance, if $\pi_{3i} = -1$, this means that average life satisfaction during Unemployment 2 for individual *i* is one scale-point lower than it had been during the reference time period Unemployment 1. Similarly, the coefficients π_{1i}, π_{2i}, π_{4i}, and π_{6i} represent the contrasts between life satisfaction during the (re)employment periods (baseline, RE 1, RE 2, RE 3) and Unemployment 1, respectively.

In Figure 4.1a, the average level of life satisfaction of individual *i* during the unemployment periods is lower than during the reemployment periods. However, the average level of life satisfaction is similar for the three unemployment periods. The parameters π_{3i} and π_{5i} have values of zero. Figure 4.1b depicts an adaptation pattern. Here, the level of life satisfaction at Unemployment 2 and Unemployment 3 is above the level of life satisfaction at Unemployment 1. This effect is again represented by the coefficients π_{3i} and π_{5i} which have positive values. If π_{5i} is greater than π_{3i}, as it is the case in our example in Figure 4.1b, this would indicate that adaptation continues from Unemployment 2 to Unemployment 3.

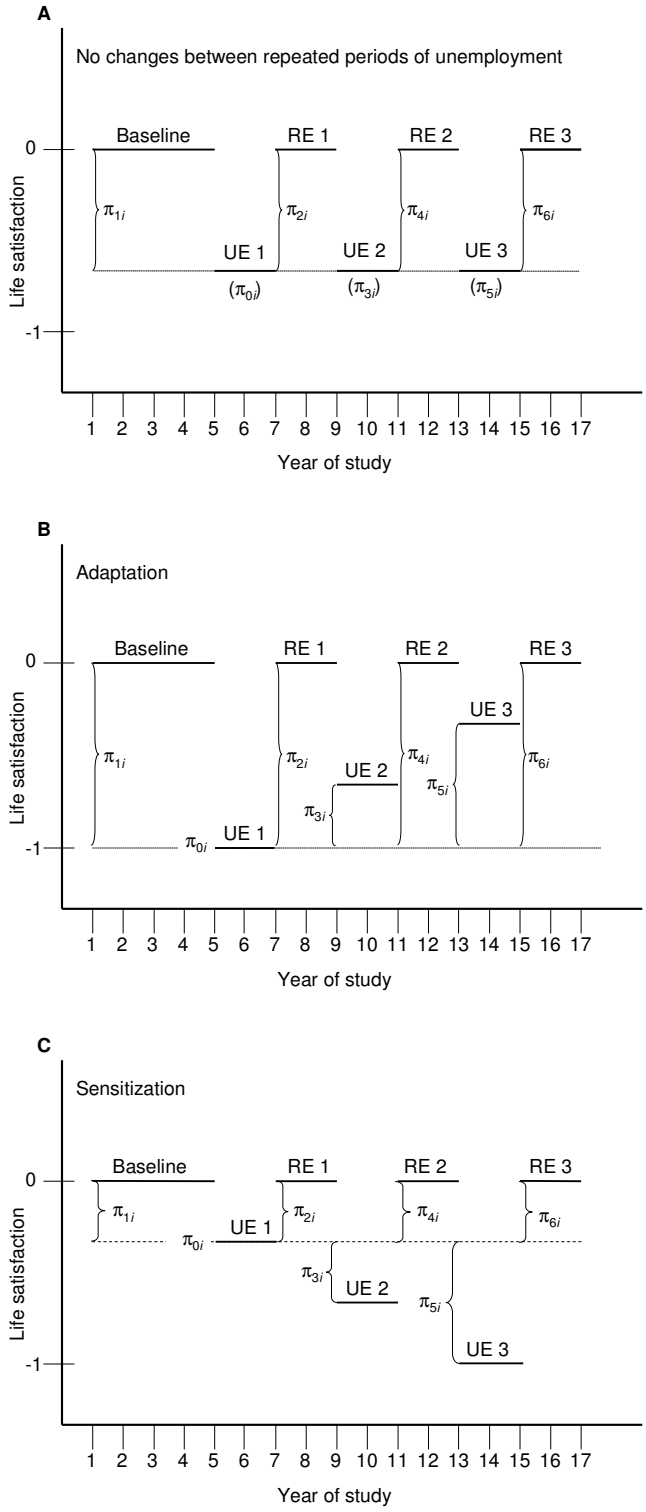

Figure 4.1. Possible reaction patterns for the example of repeated unemployment (adapted and extended from Lucas et al., 2003, Figure 1, p. 531).

Part A illustrates the case of no changes in life satisfaction between repeated periods of unemployment ($\pi_{3i} = \pi_{5i} = 0$). Part B illustrates the adaptation pattern ($0 < \pi_{3i} < \pi_{5i}$). Part C illustrates the sensitization pattern ($0 > \pi_{3i} > \pi_{5i}$). Baseline = years preceding Unemployment 1. UE 1, UE 2, UE 3 = Unemployment 1, Unemployment 2, Unemployment 3. RE 1, RE 2, RE 3 = Reemployment 1, Reemployment 2, Reemployment 3.

Finally, Figure 4.1c illustrates a sensitization pattern. Here, the level of life satisfaction at Unemployment 2 and Unemployment 3 is below the level of life satisfaction at Unemployment 1. The magnitude of these decreases is represented by the coefficients π_{3i} and π_{5i} which have negative values. If π_{5i} is more negative than π_{3i}, as it is the case in our example in Figure 4.1c, this would indicate that sensitization continues from Unemployment 2 to Unemployment 3.

As mentioned above, we did not include any level-2 predictor variables in the simple model. The general level-2 equation for the simple model was then

$$\pi_{vi} = \beta_{v0} + r_{vi}, \qquad v = 0, \ldots, 8,$$

where π_{vi} denotes the regression intercept ($v = 0$) or the regression slope ($v = 1, \ldots, 8$) of individual i, β_{v0} indicates the mean parameter value, and r_{vi} indicates individual deviations from the mean parameter value.

How should these coefficients be interpreted? Note that the π-parameters in the level-1 model represent *individual* values and the β-parameters in the level-2 model represent *mean* values across all individuals. Consequently, if the parameters β_{30} and β_{50} are not significantly different from zero, this would indicate that there are no *mean* changes in life satisfaction between different periods of unemployment. If, in addition, the corresponding variance components r_{3i} and r_{5i} have variances of zero, there would be no mean *and* no individual changes in life satisfaction. By contrast, if the parameters β_{30} and β_{50} are not significantly different from zero, but the corresponding variance components are nonzero, this would mean that there are no changes in life satisfaction on the mean level, but there are interindividual differences in individual changes over time. The parameters in the adaptation model and in the sensitization model would be interpreted analogously.

Differential Reaction vs. Accumulation

In the introduction, we stated that varying levels of life satisfaction at different occasions of an event can be explained by a differential reaction to the event as well as by factors accumulating over a longer time period. In the case of a sensitization or adaptation pattern, our next step would be to analyze which of these processes applies.

We would have a differential reaction, but no accumulation, if the level of life satisfaction differs between the event periods (e.g., between the unemployment periods) and, simultaneously, the level of life

satisfaction in the intermittent periods (e.g., during the reemployment periods) is constant. This assumption can easily be tested by contrasting the coefficients of the intermittent periods using the χ^2-based Wald-test. A non-significant result would indicate that the different levels of life satisfaction of the event periods can be attributed completely to a differential reaction to these events. A significant result would indicate that accumulation is in effect.

We have an accumulation of influential factors, but no changes in the reaction, if the level of life satisfaction differs between the event periods and, simultaneously, the magnitude of the reaction is constant across the different occasions of the event. We can quantify the magnitude of the reaction by calculating the difference between the pre-event level of life satisfaction and the event level of life satisfaction separately for each event occasion. Next, we compare these mean difference scores by conducting t-tests for dependent samples. If the change in life satisfaction is solely caused by an accumulation process, the magnitude of the reaction should be similar across different occasions of the event, that is, the t-tests should yield non-significant results.

Finally, differential reaction and accumulation can occur simultaneously. This would be the case if we find both different levels of life satisfaction in the intermittent periods and different magnitudes of the reaction to the event.

Extended Model

For the extended model, our aim was to include all the level-2 variables that were relevant to our research questions and, at the same time, to keep the models as parsimonious as possible. Therefore, we included level-2 variables for those parameters only that represent changes in life satisfaction during the time periods when the repeated events took place. For instance, we included level-2 variables for Unemployment 2, but not for Reemployment 2, as we were interested in individual differences during unemployment only.

The coefficients of the level-2 variables that predict variation in the intercept reflect main effects. For instance, a negative coefficient of neuroticism would indicate that neurotics report lower life satisfaction scores at the first occasion of the event. The coefficients of the level-2 variables that predict variation in the remaining time periods reflect cross-level interactions and have to be interpreted together with the main effects. For instance, a positive interaction effect of Gender × Unemployment 2 would mean that the gender difference observed during the reference time period Unemployment 1 has increased during Unemployment 2, controlling for the other level-2 predictors.

Whenever level-2 variables for a specific level-1 parameter were entered in the model, we included the following variables: (a) gender and (b) age at the first event as demographic variables, (c) extraversion, and (d) neuroticism as person-related variables, and (e) duration of the first event as an event-related

variable. All level-2 variables were grand-mean centered except for gender which was dummy-coded. The dummy variable indicating the number of experienced events was only entered for those level-1 parameters that could be calculated for both groups. For instance, life satisfaction at Unemployment 1 can be estimated for the whole subsample, whereas life satisfaction at Unemployment 2 can only be estimated for those who where unemployed at least twice.

The general level-2 equation for the extended model is given by

$$\pi_{vi} = \beta_{v0} + \beta_{v1}(FEMALE_i) + \beta_{v2}(AGE_i) + \beta_{v3}(EXTRAV_i) + \beta_{v4}(NEURO_i) + \beta_{v5}(DURATION_i) [+ \beta_{v6}(SINGLE\text{-}EVENT_i)] + r_{vi},$$

where π_{vi} denotes the regression intercept ($v = 0$) or the regression slope ($v = 1, \ldots, 8$) of individual i, $FEMALE_i$ is the dummy-coded variable indicating gender (1 = female, 0 = male) of individual i, AGE_i indicates centered age at the first event, $EXTRAV_i$ indicates centered extraversion, $NEURO_i$ indicates centered neuroticism, $DURATION_i$ indicates centered duration of the first event, $SINGLE\text{-}EVENT_i$ indicates whether the event was experienced once or repeatedly (1 = single events, 0 = repeated events), and r_{vi} indicates the corresponding variance component. *SINGLE-EVENT* is put in brackets to clarify that this variable is not included in all level-2 equations but only for those parameters that can be estimated for all individuals.

In the extended model, the interpretation of the intercept coefficients β_{00}, β_{10} and so on is different from their interpretation in the simple model. They do now represent predicted life satisfaction scores for *males* having experienced the event *at least twice* with a *mean* autoregressive parameter, *mean* age, *mean* extraversion, *mean* neuroticism, and *mean* duration of the first event. In the result sections below, we will always present estimates for both the simple model and the extended model.

4.5 Study 1: Repeated Unemployment

4.5.1 Analytic Model

Both the simple model and the extended model were built according to the modeling strategy described above. On level-1, time was split into seven periods: (1) years before the first unemployment (baseline, π_{1i}), (2) Unemployment 1 (π_{0i}), (3) Reemployment 1 (π_{2i}), (4) Unemployment 2 (π_{3i}), (5) Reemployment 2 (π_{4i}), (6) Unemployment 3 (π_{5i}), (7) Reemployment 3 and all subsequent years (π_{6i}). In addition, an

autoregressive parameter (π_{7i}) was included. All parameters were treated as random, allowing for variance in the coefficients.

The year of the first unemployment was taken as reference time period with zeros on all dummy variables. The overall intercept (π_{0i} in the level-1 model and β_{00} in the composite model, respectively) could therefore be interpreted as the average deviation of life satisfaction of the sample in that time period. Differences in reaction to repeated unemployment were tested directly by examining the coefficients of Unemployment 2 (π_{3i} in the level-1 model and β_{30} in the composite model, respectively) and Unemployment 3 (π_{5i} in the level-1 model and β_{50} in the composite model, respectively).

4.5.2 Results

Mean Changes in Life Satisfaction

The fixed effects of the simple model are reported in Table 4.2. The overall intercept β_{00} reflected the average deviation of life satisfaction at Unemployment 1 from the average life satisfaction of the total sample for individuals with an average autoregressive effect (reference group). The coefficients of the time-period dummy variables (β_{10}, β_{20}, …, β_{60}) represented average changes in life satisfaction in the respective time periods, compared with life satisfaction at Unemployment 1. During Unemployment 1, life satisfaction in our sample was $\beta_{00} = -0.52$, $t(3349) = -20.43$, $p < .001$. Life satisfaction of the reference group is therefore considerably lower in this time period than in the total sample (which is zero due to the centering of the data on the means of the total sample). The baseline parameter was positive, $\beta_{10} = 0.46$, $t(3349) = 19.31$, $p < .001$, indicating that the average life satisfaction in this group was significantly higher before the first unemployment. As the parameters β_{00} and β_{10} have similar absolute values, the mean life satisfaction of this subsample does not differ substantively from the average life satisfaction in the total sample.

We tested differences in the level of life satisfaction at later unemployment periods by examining the coefficients β_{30} and β_{50}. The coefficients were both negative, $\beta_{30} = -0.16$, $t(3349) = -3.60$, $p = .001$ and $\beta_{50} = -0.44$, $t(3349) = -4.85$, $p < .001$, indicating a mean sensitization effect. In order to test whether life satisfaction decreased further between Unemployment 2 and Unemployment 3, we contrasted these coefficients using the multivariate hypothesis testing function in HLM which is based on the χ^2-distributed Wald-Test. This difference was significant, $\chi^2\ (1) = 8.31$, $p = .004$, suggesting that sensitization continues in later unemployment periods.

Table 4.2. Simple Model for the Multilevel Regression Analysis of Life Satisfaction and Repeated Unemployment

Effect	**Coefficient**	***SE***	***t*(3349)**	***p***
Unemployment 1, π_{0i}				
β_{00}	-0.51	0.03	-20.43	< .001
Baseline, π_{1i}				
β_{10}	0.46	0.02	19.31	< .001
Reemployment 1, π_{2i}				
β_{20}	0.34	0.02	14.16	< .001
Unemployment 2, π_{3i}				
β_{30}	-0.16	0.05	-3.60	.001
Reemployment 2, π_{4i}				
β_{40}	0.19	0.04	4.45	< .001
Unemployment 3, π_{5i}				
β_{50}	-0.44	0.09	-4.85	< .001
Reemployment 3, π_{6i}				
β_{60}	0.00	0.08	0.04	.972
Autoregression, π_{7i}				
β_{70}	0.23	0.01	40.80	< .001

Note. Random slopes model with robust standard errors. $N = 3350$.

The coefficients of the remaining time periods β_{20}, β_{40}, and β_{60} represented life satisfaction changes during the reemployment periods. In general, reemployment had a positive effect on life satisfaction, $\beta_{20} = 0.34$, $t(3349) = 14.16$, $p < .001$ and $\beta_{40} = 0.19$, $t(3349) = 4.45$, $p < .001$. The coefficients β_{10} and β_{20} differed significantly, χ^2 (1) = 35.02, $p < .001$. This indicates that during Reemployment 1, people on average did not reach their pre-unemployment level of life satisfaction. In the reemployment years after Unemployment 3, life satisfaction did not differ significantly from life satisfaction at Unemployment 1, $\beta_{60} = 0.00$, $t(3349) = 0.04$, $p = .972$. This result suggests that on average, people did not recover from the stress associated with unemployment when they had been unemployed more than twice. One has to keep in mind, though, that these individuals might have become unemployed again during this period, as all subsequent years after the third reemployment were also included in this variable.

Differential Reaction vs. Accumulation

To test whether the mean sensitization effect can be explained with an accumulation of negative factors or with a differential reaction, we contrasted those coefficients that represent the reemployment periods. The coefficient for Reemployment 2 (β_{40}) is significantly smaller than the coefficient for Reemployment 1 (β_{20}), χ^2 (1) = 13.23, p = .001. Similarly, the coefficient for Reemployment 3 (β_{60}) is significantly smaller than the coefficient for Reemployment 2 (β_{40}), χ^2 (1) = 6.07, p = .013. This means that the decrease in life satisfaction cannot only be observed from one unemployment period to the next, but also from one reemployment period to the next. The negative effects of repeated unemployment accumulate over time.

To test differential reactions, we compared the reaction scores which were calculated by subtracting life satisfaction at the event from life satisfaction before the event for each individual. We then conducted t-tests for dependent samples to compare whether the mean reaction scores differed across the event occasions. There were no significant effects: Neither did the reaction to Unemployment 2 differ from the reaction to Unemployment 1, M_{diff} = 0.01, SD_{diff} = 2.37, $t(645)$ = 0.12, p = 0.91, d = 0.01, nor did the reaction to Unemployment 3 differ from the reaction to Unemployment 2, M_{diff} = –0.26, SD_{diff} = 3.49, $t(178)$ = –1.01, p = 0.31, d = 0.11. This means that the sensitization effect can be attributed completely to the accumulation of stress factors associated with repeated unemployment, and not to a different reaction to the event itself.

Predictors of Interindividual Differences

We found significant variance components for both Unemployment 2 (variance component = 0.53), $\chi^2(134, N = 135) = 205.52$, $p < .001$, and Unemployment 3 (variance component = 0.54), $\chi^2(134, N = 135) = 220.00$, $p < .001$, indicating that there is considerable interindividual variation in life satisfaction at these time periods.

The results for the extended model are presented in Table 4.3. All the level-2 predictors were significantly different from zero at Unemployment 1. These effects can be interpreted as main effects, that is, they tell us about general differences between individuals. Specifically, lower scores in life satisfaction at Unemployment 1 are reported by individuals who are male, older, more neurotic and less extraverted, and who would be unemployed for a longer period. In addition, those who were unemployed only once reported higher scores of life satisfaction at Unemployment 1 than those who would become unemployed again.

Table 4.3. Extended Model for the Multilevel Regression Analysis of Life Satisfaction and Repeated Unemployment

Effect	**Coefficient**	***SE***	***t*** [a]	***p***
Unemployment 1, π_{0i}				
Intercept, β_{00}	-0.74	0.05	-16.20	< .001
Female, β_{01}	0.15	0.06	4.17	< .001
Age, β_{02}	-0.01	0.00	-4.74	< .001
Extraversion, β_{03}	0.08	0.02	4.86	< .001
Neuroticism, β_{04}	-0.20	0.02	-12.41	< .001
Duration, β_{05}	-0.07	0.01	-8.00	< .001
Single event, β_{06}	0.23	0.04	5.26	< .001
Baseline, π_{1i}				
Intercept, β_{10}	0.50	0.05	9.75	< .001
Female, β_{11}	-0.11	0.04	-2.93	.004
Age, β_{12}	0.00	0.00	0.67	.503
Extraversion, β_{13}	-0.06	0.02	-3.59	.001
Neuroticism, β_{14}	0.06	0.02	3.66	< .001
Duration, β_{16}	0.03	0.01	3.05	.003
Single event, β_{16}	-0.01	0.05	-0.22	.823
Reemployment 1, π_{2i}				
Intercept, β_{20}	0.32	0.03	12.92	< .001
Unemployment 2, π_{3i}				
Intercept, β_{30}	-0.23	0.07	-3.51	.001
Female, β_{31}	0.19	0.09	2.25	.024
Age, β_{32}	0.00	0.00	0.03	.981
Extraversion, β_{33}	-0.09	0.04	-2.07	.038
Neuroticism, β_{34}	-0.07	0.04	-1.73	.084
Duration, β_{36}	0.02	0.03	0.54	.587
Reemployment 2, π_{4i}				
Intercept, β_{40}	0.23	0.05	4.80	< .001
Unemployment 3, π_{5i}				
Intercept, β_{50}	-0.43	0.13	-3.35	.001
Female, β_{51}	-0.01	0.16	-0.07	.949
Age, β_{52}	0.00	0.01	0.20	.844
Extraversion, β_{53}	0.13	0.09	1.50	.133
Neuroticism, β_{54}	-0.06	0.07	-0.81	.419
Duration, β_{56}	-0.05	0.07	-0.67	.504

Effect	Coefficient	*SE*	*t* [a]	*p*
Reemployment 3, π_{6i}				
Intercept, β_{60}	.02	0.08	0.31	.757
Autoregression, π_{7i}				
Intercept, β_{70}	0.23	0.01	40.33	< .001

Note. Random slopes model with robust standard errors. N = 3350.

[a] *df* for Unemployment 1 and Baseline = 3343. *df* for Unemployment 2 and Unemployment 3 = 3344.

df for Reemployment 1, Reemployment 2, Reemployment 3, and Autoregression = 3349.

Females report higher life satisfaction scores throughout all time periods. The gender effect found at Unemployment 1 (β_{01}) is increased at Unemployment 2 (β_{31}) and remains stable at Unemployment 3 (β_{51}). At baseline (β_{11}), however, we found a negative coefficient for gender, indicating a differential reaction of males and females to unemployment. For better interpretation, the gender differences are depicted in Figure 4.2. One can see clearly that sensitization is more pronounced for males than for females.

Age was related negatively to life satisfaction at Unemployment 1. The corresponding effects in the remaining time periods (β_{12}, β_{32}, and β_{52}) were all non-significant, indicating that age did not account for any differential reactions to unemployment. Rather, older people were less satisfied with their lives from the very start of their participation in the GSOEP and throughout the following time periods.

Higher neuroticism was associated with lower life satisfaction at Unemployment 1 (β_{04}). The corresponding effect at baseline (β_{14}) was positive which means that individuals high in neuroticism reacted more negatively to unemployment than individuals low in neuroticism. The remaining effects of neuroticism were non-significant, indicating that the differences observed at Unemployment 1 were stable over time.

Extraversion was associated with higher life satisfaction at Unemployment 1 (β_{03}). The corresponding effect at baseline (β_{13}) was of a similar magnitude, but in the opposite direction, indicating that extraversion moderates the reaction to unemployment in the sense that introverts react more negatively to becoming unemployed than extraverts.

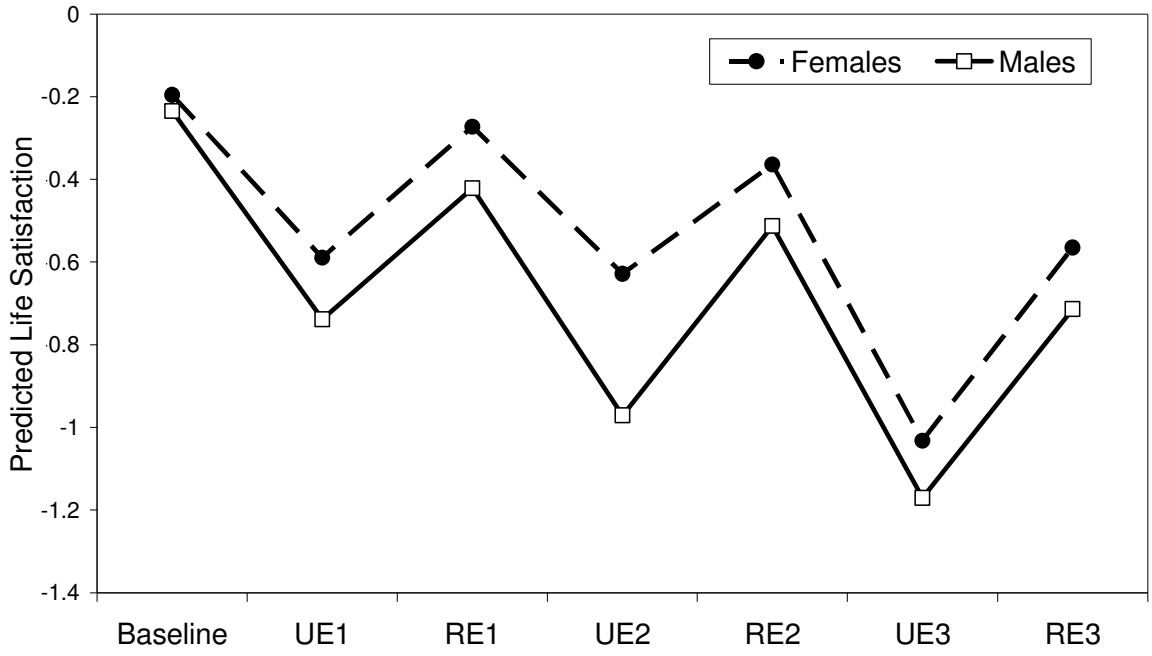

Figure 4.2. Predicted life satisfaction scores for males and females for repeated unemployment.

Data points show predicted scores for males and females of mean age, mean extraversion, mean neuroticism, mean duration of first unemployment, and mean intraindividual stability. Baseline = years preceding Unemployment 1. UE 1, UE 2, UE 3 = Unemployment 1, Unemployment 2, Unemployment 3. RE 1, RE 2, RE 3 = Reemployment 1, Reemployment 2, Reemployment 3.

A longer duration of the first unemployment period was associated with lower life satisfaction scores (β_{05}) during this time period. This effect can partly be explained by a differential reaction to becoming unemployed, as the corresponding effect at baseline (β_{15}) was positive, but not of the same magnitude. Consequently, those who would be unemployed longer were less happy initially and reported greater decreases in life satisfaction than those who would be unemployed only for a short term.

Finally, we examined differences between once-unemployed and repeatedly unemployed individuals. These two groups differed significantly at Unemployment 1 (β_{06}). The non-significant effect at baseline (β_{16}) shows that this difference cannot be explained by a differential reaction. Thus, happy people seem to be less prone to become unemployed repeatedly than unhappy people.

4.5.3 Discussion

Being unemployed does not always feel the same. Rather, repeated unemployment is associated with a downward trend in life satisfaction. In our analyses, we found a mean sensitization effect for repeated unemployment, which means that, on average, life satisfaction decreases more and more with each un-

employment period, controlling for autoregressive stability. Lucas et al. (2004) and Clark et al. (2001) found that individuals with previous unemployment were less satisfied with their lives than individuals with no previous unemployment. Our study adds a longitudinal perspective to these findings. The results suggest that the lower life satisfaction scores reported by frequently unemployed persons are likely to be caused by repeated unemployment.

We found that the decrease in life satisfaction is not limited to the unemployment periods, but it can also be observed during the intermittent periods of reemployment. These findings support the stress accumulation hypothesis (Warr, 1987), that is, repeated unemployment seems to be associated with a long-term accumulation of stressors that are effective not only during unemployment, but also during the supposedly more peaceful episodes of reemployment. The greatest stressor is probably the depletion of financial and social resources. In Germany, the unemployed receive financial aids; however, these aids compensate the loss of income insufficiently. Whereas during the first unemployment, many people might be able to rely on their financial savings, these savings are likely to be exhausted during later unemployment and reemployment periods. Concerning social resources, unemployment is often associated with marital and familial problems (Ström, 2003; Vinokur, Price, & Caplan, 1996) which do not necessarily disappear during reemployment and which might even be aggravated with each new unemployment experience.

There are considerable interindividual differences in life satisfaction during repeated unemployment that can partially be explained by some of the moderator variables we included in our models. First, males report lower life satisfaction scores during unemployment than females. This gender effect is probably due to the somewhat higher importance of work for males which can be explained by traditional gender roles. Traditionally, males were the bread-earners of their families while their wives took care of children and household. It would therefore be easier for females to adapt to unemployment because staying home is compatible with their traditional gender role. Males, by contrast, are more likely to experience a loss in self-esteem when becoming unemployed because they cannot fulfill their traditional role anymore. Of course, these traditional gender roles are changing and more and more females are having careers. It is possible that the gender effect found in our data will disappear in the next decades.

Second, older age is associated with lower life satisfaction not only at Unemployment 1, but also throughout the remaining time periods. It is not surprising that unemployment has worse consequences on life satisfaction of older people as it is well-known that older people have fewer chances on the job market than young people. However, it is less evident why older people in our subsample are less happy even before the first unemployment.

There are various possible explanations for this effect. First, it could be due to cohort effects, that is, older generations in the sample might generally be less happy than younger generations. Second, higher age might generally be associated with decreasing life satisfaction. Research on the relation between age and life satisfaction has provided mixed evidence, though overall, life satisfaction seems to increase with age (Argyle, 2001). However, recent evidence based on the GSOEP suggests that older age might be associated with declining life satisfaction (Gerstorf et al., 2008). Third, people often anticipate forthcoming life events, even if these events are not controllable as it is often the case for unemployment (e.g., Lucas et al., 2004). The anticipation of a negative event can affect present life satisfaction through affective forecasting (Wilson & Gilbert, 2005). Age differences in life satisfaction observed during the event itself might also be measurable during the anticipating phase, that is, in anticipating future unemployment, older people should report lower present life satisfaction. Finally, there might be an interaction effect of age with level of life satisfaction in the sense that for older people, but not for younger people, the likelihood of unemployment is higher for those with lower life satisfaction.

Third, we found further evidence that neuroticism and extraversion account for interindividual differences in stress reactivity (e. g., Bolger & Zuckerman, 1995; Larsen & Ketelaar, 1991). Specifically, neuroticism is associated with a more negative reaction to unemployment, and extraversion is associated with a less negative reaction to unemployment.

Finally, we found some very interesting main effects of the duration of the first unemployment period and the experience of one versus repeated unemployment on the level of life satisfaction at Unemployment 1. For both variables, we found lower life satisfaction scores for those who would experience more adversity, either by being unemployed longer or by becoming unemployed again, before these adverse conditions had come into effect.

These findings suggest that the causal relation between unemployment and life satisfaction might be bidirectional: Unemployment decreases life satisfaction, and lower life satisfaction might cause prolonged or frequent unemployment. There are at least two possible explanations for this: First, these individuals might anticipate future adversity and react with present low life satisfaction. Second, their initially low life satisfaction might predispose them to experience more or prolonged adverse states in the future. Likewise, individuals who were initially happier might be predisposed to find reemployment faster und to avoid future unemployment more successfully (Lyubomirsky, King, & E. Diener, 2005). Our data do not provide any information about these possible processes. Therefore, future research should employ experimental designs to examine these propositions and to establish the possible causal effect of life satisfaction on unemployment.

4.6 Study 2: Repeated Divorces

4.6.1 Analytic Model

The basic analytic approach was the same as in Study 1. However, we modified the level-1 model in two aspects. First, we were not able to include a third event because the number of individuals having divorced more than twice was too small. Second, in addition to including time variables indicating the current marital status, we split the time periods of the divorces into two separate variables, respectively. One dummy variable indicated the year before the divorce and the year of the divorce itself. The year before the divorce was included because the decline in life satisfaction associated with divorce typically starts sometime before the legal event of divorce itself takes place (see Lucas, 2005, for a similar approach). A second dummy variable indicated the subsequent years following the divorce. This distinction had not been possible for repeated unemployment because the average duration of the unemployment periods was only two years (see Table 4.1).

Consequently, time was split into five periods: years before the first divorce / baseline (π_{1i}), year before the first divorce and year of the first divorce (π_{0i}), Divorce 1 without first year (π_{2i}), Marriage 2 (π_{3i}), year before the second divorce and year of the second divorce (π_{4i}), and Divorce 2 and all subsequent years without the first year (π_{5i}). In addition, the grand-mean centered life satisfaction at wave $t - 1$ (π_{6i}) was included. All parameters were treated as random, allowing for variance in the coefficients.

The time period including the two years of the first divorce was taken as a reference time period with zeros on all variables. The overall intercept β_{00} could therefore be interpreted as the average life satisfaction in these years. Mean differences in life satisfaction at the second divorce were tested directly by examining the coefficient of the two years of Divorce 2 (β_{40}).

4.6.2 Results

Mean Changes in Life Satisfaction

The results for the simple model are reported in Table 4.4. The overall intercept showed that in the two years of Divorce 1, life satisfaction for individuals with an average autoregressive effect (reference group) was more than half a point below the average life satisfaction of the total sample, $\beta_{00} = -0.54$, $t(920) = -11.10$, $p < .001$. The baseline parameter was positive, $\beta_{10} = 0.28$, $t(920) = 5.79$, $p < .001$, which means that life satisfaction had been higher before the first divorce, but still below the mean of the total sample because the absolute value of β_{10} was smaller than the absolute value of β_{00}. This

shows that people with divorces reported a level of life satisfaction that was below average even before the first divorce happened.

Life satisfaction at Divorce 2 was significantly higher than at Divorce 1, $\beta_{40} = 0.34$, $t(920) = 2.52$, $p = .012$, indicating an adaptation effect. Moreover, life satisfaction was also higher than at Divorce 1 during most of the other time periods as almost all time-related coefficients were positive. The only exception to this general pattern was the years following Divorce 2 where no significant difference in life satisfaction compared to Divorce 1 could be detected, $\beta_{50} = 0.07$, $t(920) = 0.64$, $p = .521$.

Table 4.4. Simple Model for the Multilevel Regression Analysis of Life Satisfaction and Repeated Divorces

Effect	**Coefficient**	***SE***	***t* (920)**	***p***
Years of Divorce 1, π_{0i}				
β_{00}	-0.54	0.05	-11.08	< .001
Baseline, π_{1i}				
β_{10}	0.28	0.05	5.79	< .001
Divorce 1 without 1st year, π_{2i}				
β_{20}	0.18	0.05	3.66	< .001
Marriage 2, π_{3i}				
β_{30}	0.36	0.06	5.90	< .001
Years of Divorce 2, π_{4i}				
β_{40}	0.34	0.14	2.52	.012
Divorce 2 without 1st year, π_{5i}				
β_{50}	0.07	0.11	0.64	.521
Autoregression, π_{6i}				
β_{60}	0.23	0.01	22.59	< .001

Note. Random slopes model with robust standard errors. $N = 921$. Year of Divorce 1 and Year of Divorce 2 both include the precedent year.

Differential Reaction vs. Accumulation

To test whether the mean adaptation effect can be explained by long-term accumulating factors or by a differential reaction, we contrasted the time periods preceding each divorce, that is, baseline and second marriage. The corresponding coefficients did not differ significantly, $\chi^2(1) = 0.99$, $p > .500$, suggesting that the average level of life satisfaction was similar in both time periods. Therefore, the average adaptation effect cannot be explained by accumulating factors, but rather a differential reaction to this event has taken place: Divorcing for the second time in life triggers a weaker (less negative) reaction than divorcing for the very first time.

Predictors of Interindividual Differences

The variance component for Divorce 2 was significant (variance component = 0.24), $\chi^2(11, N = 12) = 19.85$, $p = .047$, indicating that people differ in their coefficients for this time period. Results for the extended model are reported in Table 4.5. Individual differences in life satisfaction at Divorce 1 could partially be explained with differences in gender, neuroticism, and age at Divorce 1. Specifically, higher scores in life satisfaction were reported by females, younger people and people low in neuroticism.

At Divorce 2, none of the corresponding level-2 coefficients was significant. This means that these variables cannot explain differential reactions that are specific for Divorce 2. In order to test whether these variables can explain differential reactions to the first divorce, we examined the corresponding effects for the baseline parameter. There was a significant gender effect (β_{11}), indicating that males reacted more strongly to the first divorce than females.

Older individuals were more likely to report lower life satisfaction scores at Divorce 1 than younger individuals (β_{02}). Similarly to our results for repeated unemployment, age could not explain differential reactions to the first divorce, as the corresponding effect at baseline (β_{12}) was zero.

Higher neuroticism was associated with lower life satisfaction at Divorce 1 (β_{04}). Again similarly to our results for unemployment, the corresponding effect at baseline (β_{14}) was positive. This means that individuals high in neuroticism reacted more negatively to divorce than individuals low in neuroticism.

Table 4.5. Extended Model for the Multilevel Regression Analysis of Life Satisfaction and Repeated Divorces

Effect	Coefficient	*SE*	*t* [a]	*p*
Years of Divorce 1, π_{0i}				
Intercept, β_{00}	-0.57	0.13	-4.41	< .001
Female, β_{01}	0.18	0.07	2.67	.008
Age, β_{02}	-0.01	0.00	-2.25	.025
Extraversion, β_{03}	0.04	0.03	1.38	.169
Neuroticism, β_{04}	-0.25	0.03	-9.20	< .001
Duration, β_{05}	-0.01	0.01	-1.07	.284
Single event, β_{06}	-0.08	0.13	-0.65	.517
Baseline, π_{1i}				
Intercept, β_{10}	-0.07	0.15	-0.45	.655
Female, β_{11}	-0.16	0.07	-2.23	.026
Age, β_{12}	0.00	0.00	0.91	.365
Extraversion, β_{13}	-0.03	0.03	-1.03	.306
Neuroticism, β_{14}	0.08	0.03	2.67	.008
Duration, β_{15}	-0.02	0.01	-1.95	.051
Single event, β_{16}	0.46	0.15	3.03	.003
Divorce 1 without 1st year, π_{2i}				
Intercept, β_{20}	0.18	0.05	3.71	< .001
Marriage 2, π_{3i}				
Intercept, β_{30}	0.36	0.06	5.89	< .001
Years of Divorce 2, π_{4i}				
Intercept, β_{40}	0.42	0.19	2.19	.028
Female, β_{41}	-0.13	0.26	-0.53	.598
Age, β_{42}	-0.02	0.01	-1.66	.098
Extraversion, β_{43}	0.11	0.10	1.11	.266
Neuroticism, β_{44}	0.03	0.09	0.34	.733
Duration, β_{46}	0.06	0.04	1.41	.159
Divorce 2 without 1st year, π_{5i}				
Intercept, β_{50}	-0.02	0.11	-0.19	.850
Autoregression, π_{6i}				
Intercept, β_{60}	0.23	0.01	22.63	< .001

Note. Random slopes model with robust standard errors. N = 921. Year of Divorce 1 and Year of Divorce 2 both include the precedent year.

[a] *df* for Year of Divorce 1 and Baseline = 914. *df* for Divorce 2 = 915. *df* for all other predictors = 920.

There were no differences between those who would divorce only once and those with repeated divorces at Divorce 1 (β_{06}). However, the corresponding effect at baseline (β_{16}) was positive. This is an interesting finding as it indicates that those who would divorce only once were initially more satisfied with their lives than those who would divorce repeatedly. This implies that the first divorce had a more negative impact on those who would divorce only once compared to those with repeated divorces.

Finally, extraversion and the duration of the first divorce did not account for any interindividual differences in life satisfaction at any of the time periods considered.

4.6.3 Discussion

Divorce is considered to be one of the most stressful life events one can experience (e. g., Holmes & Rahe, 1967). It is usually associated with a significant drop in life satisfaction. Most people adapt, but it takes several years (Lucas, 2005). Slow as it might be, this adaptation process seems to be successful in the long term. Our findings suggest that people do not only adapt to new life circumstances evoked by divorce, but they also adapt to the event itself. On average, the second divorce has a much smaller impact on life satisfaction than the first divorce. This finding is rather unexpected as several cross-sectional studies reported lower mental health for the multiply-divorced compared to the once-divorced and (Cargan & Whitehurst, 1990; Kurdek, 1991). In cross-sectional studies, it is not possible to examine whether lower mental health is the cause or the consequence of repeated divorces. Nevertheless, the authors attributed this effect to the accumulation of stress factors that are usually associated with repeated divorces, for example, social stigma and feelings of personal failure, which consequently lead to lower mental health. However, there are several facts contradicting this view. First of all, we have to keep in mind that divorce can be a relief of the accumulation of those stress factors that are associated with a bad marriage (Williams, 2003). Moreover, the findings on the social stigmata that are associated with repeated divorces are rather old and probably do not account for recent societal changes in divorce rates and moral standards. Finally, in order to assess feelings of personal failure, one has to know why the marriage has failed, who initiated the divorce, and whether the divorced interpreted the event as controllable and predictable. Unfortunately, none of these data are available in the GSOEP.

Again, there were considerable interindividual differences in life satisfaction at the first divorce. Gender, age, and neuroticism accounted for some of these differences. On average, men reacted more negatively to the first divorce and stayed unhappier than women throughout the subsequent time periods. As outlined above, the findings on gender differences in the context of divorce are rather ambiguous. Our results support the notion that females benefit less from marriage, and therefore they have less to lose through divorce. Traditionally, females are more financially dependent on their husbands

than the other way around. Divorced females are therefore confronted with more economic problems, but they also have more opportunities to gain autonomy, self-esteem, and a sense of self-efficacy by coping well with these problems. Through divorce, both males and females lose social support that was previously provided by their spouse, but divorced females usually receive more social support from friends and family than divorced males do (Kalmijn, 2007). In sum, our findings suggest that males have more to lose through divorce (social support), and females have more to gain through divorce (independence).

For age, we found a similar finding as for repeated unemployment. Specifically, younger age was associated with higher life satisfaction throughout the time periods considered in our analyses. Older people could be more impaired by getting divorced than younger people because older age is probably confounded with the duration of the marriage. Possibly, dissolving a long-term marriage is associated with more stress than dissolving a short-term marriage. In addition, the perceived chances of finding a new spouse might be lower for older people. However, it is still not clear why older people in our subsample are less happy even before the first divorce. Here, the same explanations as for repeated unemployment apply, that is, the age effect could be explained by a general negative relation between age and life satisfaction, by effects of anticipating the event, or by an interaction effect of age with life satisfaction on likelihood of experiencing repeated divorces (see above).

Concerning neuroticism, we replicated findings that higher neuroticism is generally associated with lower life satisfaction (DeNeve & Cooper, 1998). However, neuroticism was not related to the magnitude of the reaction to divorce as no moderating effects could be found. Extraversion did not account for any interindividual differences, neither in general levels of life satisfaction nor in the reaction to divorce.

Lucas et al. (2003) found that as early as at the wedding, the would-be-divorced reported lower life satisfaction than those who would stay married throughout the study. Of course, we cannot preclude that some in the former group were less happy because they already had problems in their relationship at the time they got married. It seems more likely, though, that their habitually lower life satisfaction predisposed them to getting divorced. Our findings expand this view to two subgroups of divorced people. We found that those who would divorce repeatedly were significantly less happy at baseline than those who would divorce only once. Possibly, there is a negative relationship between the habitual level of life satisfaction and the number of divorces in a lifetime.

4.7 Study 3: Repeated Marriages

4.7.1 Analytic Model

The basic analytic approach was the same as for the previous events. The level-1 model was similar to that of repeated divorces, that is, comprising only two instead of three events, and separating the years of the event occurrences from the remaining waves.

Study 3 differed from Study 2 on repeated divorces in two aspects. First, we used a different subsample. Specifically, we now included individuals who had not been married before participating in the GSOEP, and who married at least twice during data collection. In contrast to Study 2, these individuals did not necessarily experience two divorces. Second, the reference time period was shifted from the year of the end of the first marriage to the beginning of the first marriage, allowing for a direct test of the differential impact of the first and second marriage on life satisfaction.

The final level-1 model comprised the following predictors: years before the first marriage/baseline (π_{1i}), year of the first wedding (π_{0i}), Marriage 1 without first year (π_{2i}), divorce/widowhood (π_{3i}), year of the second wedding (π_{4i}), and Marriage 2 and all subsequent years without the first year (π_{5i}). In addition, grand-mean centered life satisfaction at wave $t - 1$ (π_{6i}) was included. All parameters were treated as random, allowing for variance in the coefficients.

The year of the first wedding was taken as reference time period with zeros on all variables. The overall intercept β_{00} could therefore be interpreted as the average life satisfaction in the year of the first wedding. Mean differences in reaction to repeated marriages were tested directly by examining the intercept of the year of Marriage 2 (β_{40}).

4.7.2 Results

Mean Changes in Life Satisfaction

The results for the simple model are reported in Table 4.6. In the year of the first wedding, the average life satisfaction scores reported by the subsample was significantly higher than in the total sample, $\beta_{00} = 0.45$, $t(1949) = 13.61$, $p < .001$. The baseline parameter was negative, $\beta_{10} = -0.20$, $t(1949) = -5.97$, $p < .001$, that is, life satisfaction before the first wedding was significantly lower than in the year of the wedding. This implies that on average, the individuals in our subsamples reacted positively to getting married. However, we found a manifest decline in life satisfaction in the subsequent years. Life satisfaction during the years of the first marriage was significantly below its level in the year of the marriage, $\beta_{20} = -0.14$, $t(1949) = -4.28$, $p < .001$, and decreased even further when this marriage ended (either

through divorce or through widowhood), $\beta_{30} = -0.39$, $t(1949) = -6.31$, $p < .001$. To test whether life satisfaction at Marriage 2 differs from life satisfaction at Marriage 1, we examined the coefficient for this time period. It did not differ significantly from zero, $\beta_{40} = -0.11$, $t(1949) = -0.86$, $p = .392$, which means that life satisfaction was similar at both events. Moreover, there was no significant change in life satisfaction in the years subsequent to Marriage 2, $\beta_{50} = -0.10$, $t(1949) = -1.16$, $p = .248$.

Table 4.6. Simple Model for the Multilevel Regression Analysis of Life Satisfaction and Repeated Marriages

Effect	**Coefficient**	***SE***	***t* (1949)**	***p***
Year of 1st wedding, π_{0i}				
β_{00}	0.45	0.03	13.61	< .001
Baseline, π_{1i}				
β_{10}	-0.20	0.03	-5.97	< .001
Marriage 1 without 1st year, π_{2i}				
β_{20}	-0.14	0.03	-4.28	< .001
Divorce/widowhood, π_{3i}				
β_{30}	-0.39	0.06	-6.31	< .001
Year of 2nd wedding, π_{4i}				
β_{40}	-0.11	0.13	-0.86	.392
Marriage 2 without 1st year, π_{5i}				
β_{50}	-0.10	0.09	-1.16	.248
Autoregression, π_{6i}				
β_{60}	0.23	0.01	32.98	< .001

Note. Random slopes model with robust standard errors. $N = 1950$.

Table 4.7. Extended Model for the Multilevel Regression Analysis of Life Satisfaction and Repeated Marriages

Effect	Coefficient	*SE*	*t* [a]	*p*
Year of 1st wedding, π_{0i}				
Intercept, β_{00}	0.02	0.09	0.16	.874
Female, β_{01}	0.07	0.04	1.68	.094
Age, β_{02}	-0.01	0.00	-1.86	.062
Extraversion, β_{03}	0.08	0.02	4.55	< .001
Neuroticism, β_{04}	-0.19	0.02	-10.40	< .001
Duration, β_{05}	-0.01	0.00	-1.34	.180
Single event, β_{06}	0.42	0.09	4.62	< .001
Baseline, π_{1i}				
Intercept, β_{10}	-0.03	0.09	-0.41	.685
Female, β_{11}	-0.04	0.05	-0.92	.358
Age, β_{12}	-0.01	0.00	-1.84	.066
Extraversion, β_{13}	-0.03	0.02	-1.59	.113
Neuroticism, β_{14}	0.03	0.02	1.65	.099
Duration, β_{15}	0.01	0.00	1.74	.081
Single event, β_{16}	-0.14	0.09	-1.49	.136
Marriage 1 without 1st year, π_{2i}				
Intercept, β_{20}	-0.13	0.03	-4.06	< .001
Divorce/widowhood, π_{3i}				
Intercept, β_{30}	-0.37	0.06	-6.01	< .001
Year of 2nd wedding, π_{4i}				
Intercept, β_{40}	-0.23	0.28	-0.82	.411
Female, β_{41}	0.18	0.23	0.79	.432
Age, β_{42}	-0.01	0.01	-0.81	.419
Extraversion, β_{43}	-0.00	0.10	-0.02	.984
Neuroticism, β_{44}	0.00	0.13	0.00	> .999
Duration, β_{46}	-0.04	0.04	-0.92	.360
Marriage 2 without 1st year, π_{5i}				
Intercept, β_{50}	0.05	0.10	0.52	.604
Autoregression, π_{6i}				
Intercept, β_{60}	0.24	0.01	33.10	< .001

Note. Random slopes model with robust standard errors. $N = 1950$.

[a] *df* for Year of 1st wedding and Baseline = 1943. *df* for Year of 2nd wedding = 1944.

df for all other predictors = 1949.

Predictors of Interindividual Differences

The variance component for Marriage 2 was non-significant (variance component = .09, $\chi^2(49, N = 50) = 50.09$, $p = .430$, indicating that there is not a lot of variation in life satisfaction at this time period. The results for the extended model are reported in Table 4.7. Personality accounted for some of the interindividual differences in life satisfaction at Marriage 1. Specifically, higher life satisfaction at this

point of time was reported by people higher in extraversion (β_{03}) and lower in neuroticism (β_{04}). Moreover, we found significant differences between those who would marry only once and those who would marry at least twice during their participation in the panel (β_{06}): The former reported life satisfaction scores that were close to half a point above mean life satisfaction of the latter.

We did not find any significant cross-level interaction effects, indicating that none of the level-2 predictors could explain differential reactions to any of the remaining time periods. This implies that the effects of neuroticism, extraversion, and number of marriages were stable across all time periods. For instance, those with only one marriage were on average happier than those with repeated marriages not only in the year of their first marriage, but also before and after marriage.

4.7.3 Discussion

Two main findings emerged from our analyses on repeated marriages: Those who marry only once are generally happier than those who will marry twice or even more often. And those who marry at least twice report no differences in life satisfaction at Marriage 1 and Marriage 2.

The first finding can be interpreted as supportive evidence for the selection hypothesis that states that happy individuals are more likely to get married and to stay married than unhappy individuals (Mastekaasa, 1992). Likewise, lower life satisfaction predisposes people to experience separation and divorce. This seems to have been the case for the repeatedly-married in our subsample because obviously (at least in Germany), in order to marry a second time, the first marriage has to be terminated first.

The second finding should be interpreted in conjunction with the analyses by Lucas et al. (2003) on individual differences in the reaction to marriage. They found that although marriage has on average a short-term increasing effect on life satisfaction, this was not true for those who would eventually divorce. It is therefore not surprising that in our study, the second wedding does not affect the participants any differently than the first wedding did—not very much.

We found main effects of neuroticism and extraversion in the expected direction, that is, higher neuroticism is associated with lower life satisfaction and higher extraversion is associated with higher life satisfaction at each point of time. Similarly to our findings on repeated divorces, neither of these variables accounted for interindividual differences in the reaction to marriage.

4.8 General Discussion

4.8.1 Summary of Main Results

Our first research question concerned average changes in life satisfaction due to repeated life events. Our analyses have led to very diverse findings, depending on which event was examined. For repeated unemployment, we found an average sensitization effect, that is, the average level of life satisfaction decreases from unemployment to unemployment. For repeated divorce, we found an average adaptation effect, that is, the average level of life satisfaction is higher at the second divorce than it had been at the first divorce. Finally, we examined repeated marriages as positive events. Here, we found no differences in life satisfaction at two occasions of marriage.

The second research question addressed interindividual differences in changes in life satisfaction. Consistent with other studies (e. g., Lucas et al., 2003, 2004), we found considerable interindividual differences that could partially be explained by variables such as gender, age, personality, and the duration of the event. As we already discussed these effects in detail above, we will only highlight the most important findings at this point.

Neuroticism was an important predictor of interindividual differences across all events. Concerning the two negative events, higher neuroticism was associated with a stronger (more negative) reaction to the event. In addition, neuroticism accounted for stable individual differences in life satisfaction in all of our subsamples. These findings support the vast literature on personality and subjective well-being where neuroticism is seen as one of the most important predictors of life satisfaction (e. g., Lucas, 2008).

For extraversion, the findings were somewhat similar, but not quite as consistent. In the subsample of Study 3, extraversion was generally associated with higher life satisfaction. In addition, high extraversion was associated with a weaker (less negative) reaction to unemployment, but not to a differential reaction to divorce or marriage. These findings support recent evidence that the link between that the link between extraversion and life satisfaction might be weaker than assumed (Rammstedt, 2007; Vittersø, 2001).

Across the three events, those who had experienced the event only once were happier than those who had experienced the event twice or more, even before the first occasion of the event. In a recent meta-analysis, Lyubomirsky et al. (2005) showed that happy people are more likely than unhappy people to experience positive events such as getting married or finding a job. Based on our analyses, we can conclude that initial happiness does not only affect whether or not a specific event occurs at all, but also how often it is likely to occur. Unhappy people are more likely to experience repeated negative events

than happy people. They are also more likely to experience a positive event, marriage, repeatedly, but this might simply be because happier people did not get divorced in the first place.

We can summarize our findings as follows: First, life satisfaction at different occasions of major life events varies within individuals. Second, the impact of repeated events on life satisfaction varies between individuals. Neuroticism and extraversion were the most important variables to explain these differences.

4.8.2 Limitations

Our study was the first to systematically examine differential reactions to repeated events with longitudinal data. However, the findings are constrained by some methodological and substantial limitations which need to be resolved in future studies.

First, we had to limit the number of level-1 and level-2 predictors to keep the models parsimonious. Moreover, it is likely that we were not able to consider all cross-level interaction effects. Important moderator variables such as coping strategies or social support could not be examined because they were not available in the GSOEP. Future studies on reaction and adaptation to repeated life events should include these variables.

Second, we were only able to analyze changes in life satisfaction. It would be interesting to know whether similar results would be found for other components of subjective well-being, namely, positive affect and negative affect (E. Diener, Suh, Lucas, & Smith, 1999).

Third, the moderating effects of personality should be interpreted with caution. Neuroticism and extraversion were assessed only once, so we cannot examine whether any changes in these variables have taken place (cf. Scollon & E. Diener, 2006). Moreover, neuroticism and extraversion were measured in 2005 when most of the events had already taken place. Both negative event subsamples scored somewhat higher on neuroticism than the total sample. We do not know whether these higher scores are caused by the exposure to repeated negative life events (e. g., Costa, Herbst, McCrae, & Siegler, 2000), or whether they have predisposed the individuals in our samples to experience repeated negative life events (e. g., Headey, 2006).

Finally, although the data may be generalized to the German population, the effects might be different in other cultures. In order to assess cultural influences on the reaction patterns, attempts should be made to replicate our analyses using panel data from other countries.

In sum, the present study raises some important questions: How can we explain the differential effects of life events? Why are repeated positive events so ineffective in increasing life satisfaction? Finally, which moderator variables account for interindividual differences in reaction patterns? To answer these

questions, we need more prospective studies that examine adaptation to diverse major and minor life events.

4.8.3 Implications for Life Events Research

Most studies on the impact of repeated life events used frequency or intensity measures of life events without further distinguishing between different kinds of events. We found very diverse reaction patterns for the three events examined here, suggesting that the nature of the event needs to be considered when analyzing adaptation processes. For this purpose, we suggest that several features of life events should be taken into account, for instance, valence, domain, controllability, predictability, and normativity.

How can the events examined here be distinguished? Obviously, unemployment and divorce are rather negative events, whereas marriage is a positive event for most individuals. In accordance with other authors (Frederick & Loewenstein, 1999; Taylor, 1991), we conclude that negative life events seem to have a stronger impact on life satisfaction than positive events.

Unemployment and divorce can be further distinguished by their domain (work vs. family) and their controllability (low vs. medium to high). It would be interesting to know whether other events in the same domain trigger similar patterns of changes in life satisfaction as we have observed here, that is, sensitization in the case of repeated negative work-related events, and diverse patterns for repeated negative family-related events. In order to determine whether a classification by valence, domain, or controllability can explain these patterns, future studies should examine reaction to other repeated events in more detail.

4.8.4 Conclusion

Repeated life events affect life satisfaction in very different ways. Our findings suggest that on average, people adapt to repeated divorces. Repeated marriages do not affect people's life satisfaction any differently than single occasions of this event do. The matter is quite different for unemployment. Repeated unemployment has a severe impact on life satisfaction. As this event is quite common, we urgently need to develop programs that can prevent this downward spiral of unhappiness.

4.9 References

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5 General Discussion

General Discussion

For many years, researchers agreed that subjective well-being (SWB) is primarily determined by stable, dispositional variables, particularly personality (e. g., E. Diener, Suh, Lucas, & Smith, 1999). In the past years, however, a series of seminal studies (e. g., Fujita & E. Diener, 2005; Lucas, A. E. Clark, Georgellis, & E. Diener, 2004) indicated that the significance of external circumstances for SWB might have been previously underestimated. The present dissertation is part of a line of research that examines the differential short-term and long-term effects of two specific types of external circumstances on SWB: income and major life events.

In this final chapter, the findings of the three studies that compose this dissertation will be integrated and discussed under a broader perspective. The chapter begins with a short summary of the central findings of the three studies. The following integrative discussion will then focus on the theoretical, methodological, and practical implications of these findings.

Table 5.1. Summary of the findings in this dissertation.

Chapter	Aims	Methods	Findings
2	To examine the relative impact of stable and occasion-specific influences on the relation between income and SWB	Analysis of longitudinal data from the SOEP (N = 43,565) and the BHPS (N = 37,041 for AWB and N = 31,871 for CWB) with bivariate latent state-trait models.	The association between income and SWB on the level of stable differences is moderately positive. The association between income and SWB on the level of transient differences is positive as well, but much weaker than the correlation on the stable level. Stable determinants account for most of the covariance between income and SWB.
3	To reexamine the classic adaptation hypothesis in the context of ten major life events	Meta-analysis of 247 publications reporting longitudinal data on life events and SWB.	People adapt to most life events within a couple of years, with the exception of unemployment. Life events had stronger effects on CWB than on AWB.
4	To investigate the effects of repeated unemployment, repeated divorces, and repeated marriages on life satisfaction	Analysis of longitudinal data from three subsamples from the SOEP (N = 3,350 for unemployment; N = 921 for divorce; N = 1,950 for marriage)	Unemployment: On average, life satisfaction decreases with each new unemployment period (sensitization). Divorce: Mean life satisfaction is higher at the second divorce than it had been had the first divorce (adaptation). Marriage: Mean life satisfaction is similar at both occasions.

Notes. SOEP = Socio-Economic Panel. BHPS = British Household Panel Study. SWB = Subjective well-being. AWB = Affective well-being. CWB = Cognitive well-being.

5.1 Summary

In the previous chapters, three independent studies were presented: In Chapter 2, the relation between income and SWB was simultaneously examined on the level of stable differences and on the level of occasion-specific fluctuations. In Chapter 3, the classic adaptation hypothesis was reexamined using meta-analytic techniques. Finally, Chapter 4 focused on the impact of repeated life events on SWB. The specific aims, methodological approaches and central findings of these three studies are summarized in Table 5.1.

5.1.1 Income and SWB

Most empirical studies find a moderate positive correlation between momentary income and momentary SWB (for reviews, see Biswas-Diener, 2008; E. Diener & Biswas-Diener, 2002; R. T. Howell & C. J. Howell, 2008), yet longitudinal studies have failed to provide consistent evidence that income changes might lead to changes in SWB (e. g., Marks & Fleming, 1999; Schyns, 2001). In Chapter 2, a study was presented that might help to understand these divergent findings. In this study, the association between income and SWB was decomposed into its stable and transient components. The stable component reflected the proportion of the covariance that was due to stable interindividual differences, whereas the transient component reflected the proportion of the covariance that was due to occasion-specific, transient fluctuations. A high correlation among the stable factors would suggest that richer people are generally happier, regardless of the momentary financial situation. A high correlation among the occasion-specific factors would indicate that fluctuations in income covary with fluctuations in SWB, possibly because of a causal effect of income changes on SWB. (Note that it was not possible to test the causal direction of the relation.)

To separate these different components, bivariate latent state-trait models (Cole, Martin, & Steiger, 2005; Eid, 2008; Steyer, Schmitt, & Eid, 1999) were applied to longitudinal data obtained from the German Socio-Economic Panel (SOEP; Wagner, Frick, & Schupp, 2007) and the British Household Panel Study (BHPS; Taylor, Brice, Buck, & Prentice-Lane, 2009). Specifically, the relation between affective well-being (AWB) and income was analyzed with data from the BHPS (N = 37,041), and the relation between cognitive well-being (CWB) and income was analyzed with data from the BHPS (N = 31,871) as well as with data from the SOEP (N = 43,565). The findings suggested that the correlation between income and SWB is mostly driven by dispositional variables which would explain why changes in income often do not have any long-term effects on SWB. This conclusion is based on three main results: (a) The correlations between the stable latent factors were moderate (between r = .13 and r = .39). (b) The correlations between the occasion-specific latent factors were weak (means correlations

between $r = .03$ and $r = .08$). (c) On average, the stable factors accounted for 60 to 90 % of the observed covariance between income and SWB.

In sum, this study showed that the relation between income and SWB is much more complex than often assumed. It is not sufficient to examine the direct and indirect effects that income might have on SWB, or vice versa: Common stable influences must also be considered and, at best, modeled explicitly. Furthermore, future research needs to investigate whether the relative impact of stable and occasion-specific influences is similar for other external correlates of SWB. Bivariate latent state-trait models like the ones applied in Chapter 2 are suitable statistical tools that allow examining the short-term and long-term relations simultaneously.

5.1.2 Adaptation to Life Events

In Chapter 3, longitudinal studies on life events and SWB were aggregated meta-analytically. The literature search yielded 247 publications on five family events (marriage, divorce, bereavement, child birth, health problems in spouse) and five work events (unemployment, reemployment, retirement, other occupational transitions, relocation/migration). The primary goal of the meta-analysis was to describe the initial hedonic reaction and subsequent adaptation to these events. According to the classic adaptation hypothesis, average SWB levels should return to baseline within a couple of months (E. Diener, Lucas, & Scollon, 2006; Suh, E. Diener, & Fujita, 1996). This hypothesis was partially supported: Adaptation could be found for most events (unemployment is a notable exception; see below), but it often took several months or even years to return to the baseline level.

A very interesting effect was found when affective well-being (AWB) and cognitive well-being (CWB) were examined separately. For most events, it was found that the effects on AWB were more positive than the effects on CWB. For instance, AWB was somewhat more positive after child birth, compared to before child birth, whereas life satisfaction and particularly relationship satisfaction decreased significantly during the following months. A similar pattern was found for marriage. Moreover, the effect sizes for AWB varied considerably more than the effect sizes for CWB. These findings indicate that changing life circumstances can have strong, lasting and consistent effects on CWB, but not on AWB. These findings have important theoretical and practical implications that will be discussed in more detail below.

A major contribution of all meta-analyses is that they provide a systematic and comprehensive overview of the research field. Such an overview can be used to identify important gaps and give recommendations for future research. In the meta-analysis in this dissertation, it was revealed that a number of life events were rarely investigated in longitudinal studies. For instance, only 12 samples on divorce and 21 samples on unemployment were found. Moreover, other events that are discussed in the adaptation

literature (e. g., cosmetic surgery; Frederick & Loewenstein, 1999) could not be analyzed because few or no longitudinal studies were found. In Chapter 3, substantive and methodological gaps in the literature were named and recommendations for future studies were given.

5.1.3 Repeated Life Events

Whereas the meta-analysis focused on single occasions of major life events, the final study examined the intraindividual differences in the effects of *repeated* life events on life satisfaction. Three subsamples were drawn from the SOEP: individuals who were unemployed at least once (N = 3,350), individuals who married at least once (N = 1,950), and individuals who divorced at least once (N = 921) during their participation in the SOEP. The data were analyzed with multilevel models.

For repeated unemployment, a sensitization pattern was found which indicates that mean life satisfaction decreases with each new unemployment period. The effects of repeated divorces were just the opposite: Here, an adaptation pattern was detected, which means that mean life satisfaction at Divorce 2 was significantly higher than at Divorce 1. Finally, no significant differences between mean life satisfaction at the first marriage and mean life satisfaction at the second marriage were found.

A current topic in SWB research is the explanation of individual differences in adaptation (E. Diener et al., 2006). In this study on repeated life events, several moderator variables that accounted for some of the differences were included in the models. The specific results for gender and age effects will be discussed in a more general section below. One finding, however, should be emphasized at this point already: Individuals who experienced repeated events reported lower average life satisfaction scores than those who experienced only one occasion of these events—even before the first event actually occurred. These pre-existing differences in SWB suggest that repeated life events are not completely random, but rather, specific personality characteristics seem to predispose people to experience these events multiple times (see Section 5.2.3).

In sum, this study shows that repeated occasions of the same event do not necessarily feel the same, but rather, they can have differential effects on life satisfaction. The divergent findings for unemployment, divorce, and marriage indicate that these events have very different effects on SWB, and future research should determine which event features explain these differences. In this point, the findings clearly converge with the results of the meta-analysis (Chapter 3) and will therefore be discussed in a more integrative fashion in the next sections.

5.2 Theoretical Implications

Up to this point, the findings of the three studies that compose this dissertation were discussed separately from each other. The aim of the present section is to integrate the different findings and discuss them from a broader theoretical perspective. Specifically, four theoretical implications will be highlighted: the existence of multiple set points for AWB and CWB (Section 5.2.1), the effects of specific life events on SWB (Section 5.2.2), the influence of dispositions on external circumstances (Section 5.2.3), and gender and age differences (Section 5.2.4).

5.2.1 Differential Effects for Affective and Cognitive Well-Being

SWB is a broad construct that comprises various cognitive and affective components (E. Diener, 1984; Schimmack, 2008). Cognitive well-being (CWB) describes those components that are based on cognitive evaluations of specific life domains (domain satisfaction) or of life overall (life satisfaction). Affective well-being (AWB) refers to the frequency and intensity of positive and negative affect, that is, specific emotions and mood. AWB and CWB are empirically distinct (Lucas et al., 1996) and might therefore differ in their relations to other variables such as external circumstances. This idea was advanced by Diener et al. (2006) who proposed that people have specific set points for the different components of SWB. Chapters 2 and 3 of the present dissertation provide evident support for this hypothesis. (AWB was not examined in Chapter 4.)

In Chapter 2, stable factors accounted for 33.6 % of the total variance in AWB, on average. In contrast, the stability of CWB was estimated to be significantly higher in both the British and the German sample: Here, stable factors accounted for 40.8 % of the variance in life satisfaction ratings in the SOEP and for 46.95 % of the variance in life satisfaction ratings in the BHPS. However, this does not mean that external circumstances affect AWB to a greater extent than they affect CWB: A study by Eid and Diener (1999) suggests that the amount of intraindividual affect variability is stable enough to be considered a personality trait. This means that how much people vary in their affective well-being can mostly be explained by stable influences and much less by external circumstances.

In fact, two recent studies indicate that the correlation between income and CWB is stronger than the correlation between income and AWB (E. Diener, Kahneman, Arora, Harter, & Tov, 2009; E. Diener, Ng, Harter, & Arora, 2010). In the present dissertation, the observed correlations between income and SWB in the British sample were similar for AWB and CWB: (see Chapter 2). However, when these correlations were decomposed into their stable and occasion-specific components, substantive differences emerged: Stable differences accounted for 89.9 % of the covariance between income and AWB, compared to 59.5 % for income and CWB. These figures indicate that short-term fluctuations of in-

come and AWB are almost negligible in explaining why these variables are related. By contrast, the correlation between CWB and income is more influenced by these short-term fluctuations.

In Chapter 3, almost all life events had differential effects on AWB and CWB: The effects of life events on AWB were usually not very strong, not lasting, and varied considerably within events, whereas long-term effects could be observed for CWB only. Together, the studies presented in this dissertation showed that changes in income and important life events are more likely to affect CWB than AWB. These findings suggest that AWB and CWB need to be treated as distinct constructs that are influenced by different predictors, differ in their stability and variability, and, presumably, also have different consequences (cf. E. Diener et al., 2010). Consequently, general theories on SWB such as set-point theory need to be reexamined with respect to the distinction of AWB and CWB. Our findings suggest that the classic assumptions of set-point theory (particularly the adaptation hypothesis) might describe AWB quite well, but apply less to CWB: AWB is less reactive to changes in income, and adaptation after life events is rather fast. CWB is also a highly stable construct, but it is more susceptible to changes in external life circumstances and therefore more likely to change sustainably. Thus, the notion of multiple set points for AWB and CWB (E. Diener et al., 2006) is clearly supported in this dissertation, and future research must seek to explain these differential effects.

A promising starting point is to reconsider the different functions of AWB and CWB. Common emotion theories posit that negative emotions trigger avoidance tendencies and positive emotions trigger approach tendencies (for reviews, see Fredrickson, 2001; Frijda, 1999). In contrast to emotions, moods are not directed at specific objects, but they nevertheless affect peoples' behavior by "producing feelings and thoughts regarding one's resourcefulness" (Morris, 1999, p. 169). Thus, moods and emotions function as an "online" monitoring system of peoples' momentary well-being. This system might be highly reactive towards short-term fluctuations of external circumstances, but to function properly, it must adapt quickly to any long-term changes. Cognitive well-being, by contrast, reflects peoples' evaluations of their lives. Income should be an important criterion for this evaluation because "money is an object that many or most people desire and pursue during the majority of their waking hours" (E. Diener et al., 2010, p. 59). Similarly, major life events should have measurable and lasting effects on CWB if they threaten important goals in family or work life.

Hence, it can be hypothesized that for AWB, adaptation is functional (Frederick & Loewenstein, 1999) because it is an important component within a homeostatic system (Cummins, 2010). Although it might be possible to regulate the rate of adaptation to a certain degree (Larsen & Prizmic, 2008), it is rather unlikely that changing external circumstances will have any long-term effects on AWB. Adaptation of CWB, by contrast, might be less automatic. Wilson and Gilbert (2008) proposed that adaptation is completed when people have found an explanation for the event. Although their model is originally

intended to explain adaptation of AWB, it is probably more useful to explain adaptation of CWB because of the proposed cognitive mechanisms.

The differential effects of external circumstances on CWB and AWB do not only have implications for theory and research, but also for interventions aiming at increasing SWB. These practical implications will be discussed in Section 5.4 below.

5.2.2 Specific Life Events and SWB

Two studies in this dissertation focused on the effects of specific life events on SWB: Marital transitions (marriage and divorce) and unemployment were examined in Chapter 3 as well as in Chapter 4. The purpose of the present section is to integrate the findings on these specific events.

Unemployment

The negative effects of unemployment on SWB are perhaps the most consistent findings in research on external circumstances and SWB. Numerous cross-sectional studies have shown that becoming unemployed is associated with decreased SWB (McKee-Ryan, Song, Wanberg, & Kinicki, 2005). The meta-analytic results (Chapter 3) demonstrated that these effects are permanent. On average, adaptation to unemployment was very slow, and even after several years, the baseline level was barely regained. Moreover, repeated unemployment experiences (Chapter 4) can exacerbate these effects and trigger a veritable downward spiral. These findings are particularly striking when they are compared to the effects of other negative events on SWB, for instance, bereavement. The initial hedonic reaction to bereavement was also negative, but adaptation set in sooner and proceeded much faster.

So what are the specific features of unemployment that make this event so devastating? One plausible explanation is that the loss of financial resources is more severe for this event than for others. However, two pieces of evidence in the present dissertation suggest that this explanation is not sufficient. First, income and SWB were only weakly correlated on the occasion-specific level, suggesting that the impact of income changes on SWB is rather weak (see Chapter 2). Second, in preliminary analyses of the effects of repeated unemployment (Chapter 4), income was included as a time-varying control variable. Although this variable was positively associated with life satisfaction, including it did not have any substantive effects on the other parameters of the models. Particularly, the effects of repeated unemployment were almost the same, regardless of whether income was included in the model or not.[9]

In sum, these findings indicate that the loss of financial resources is not the central feature of unemployment, and other factors must be considered in future studies, for instance, self-esteem (Paul &

[9] This is also the reason why income was dropped from the final models that are reported in Chapter 4.

Moser, 2009), the loss of social connections (Kieselbach, 2003), marital and familial problems (Ström, 2003; Vinokur, Price, & Caplan, 1996) and the economic context (Turner, 1995). Finally, it is possible that specific stressors only emerge as people move into long-term unemployment (Cottle, 2001).

Marital Transitions

Similarly to unemployment, previous cross-sectional findings on marital status and SWB are very consistent: Married persons are, on average, happier than single, cohabiting, divorced, or widowed persons (Argyle, 2001; M. L. Diener & Diener McGavran, 2008). Does this mean that individuals become happier by getting married and unhappier when they divorce? The findings in this dissertation indicate that this is not automatically the case: For both marriage and divorce, it was found that people do, on average, adapt to these events (Chapter 3). Moreover, life satisfaction at the second divorce was, on average, higher than at the first divorce (Chapter 4). This adaptation pattern is just the opposite of what was observed for repeated unemployment (see above), indicating that divorce is not associated with comparable long-term effects.

How do these findings match the cross-sectional differences between married and unmarried individuals? Most importantly, it is essential to acknowledge that the cross-sectional and longitudinal findings refer to different levels of analysis. Cross-sectional studies examine differences between individuals whereas the longitudinal studies in this dissertation focused on differences within individuals. It is impossible to use the findings on one level to infer the expected effects on the other level (cf. Chapter 2, where the relation between income and SWB was analyzed on different levels of analysis). That means that even though getting married does not make individuals any more satisfied (at least on average), there can still be significant differences between married and unmarried persons, for instance because the married were happier than the unmarried even before their first marriage.

Furthermore, the findings describe average intraindividual effects, but there also was substantial interindividual variance which means that life satisfaction decreases very fast for some people and very slowly or not at all for others. Lucas, A. E. Clark, Georgellis, and E. Diener (2003) reported similar results and showed that the reaction to marriage was less positive and adaptation was faster for those who would eventually get divorced. This effect might also explain some of the cross-sectional differences that are typically found between married and unmarried persons.

Finally, it is important to note that the findings reported above only apply to life and relationship satisfaction. In the meta-analysis, the number of effect sizes on AWB was very small, but the results suggested that AWB might be less affected by marital transitions.

Towards a Classification of Life Events

The studies presented in Chapter 3 and 4 showed that different life events are associated with very different reactions and adaptation trajectories. For instance, life satisfaction at the second unemployment was lower than at the first unemployment period, but life satisfaction at the second divorce was actually higher than at the first. To explain these findings in a systematic way, it is necessary to identify those event features that distinguish the events and that account for their differential effects on SWB. For this purpose, a classification system for life events is needed. This classification should be developed on empirical grounds, provide a high degree of explanatory power, and, at the same time, be as parsimonious as possible which means that the number of dimensions should be reduced to a minimum. The present dissertation only examined ten different life events which is not enough in order to provide an empirical basis for the development of such a classification system. However, a number of dimensions have been proposed by previous researchers and shall be reviewed here.

Many researchers classify life events according to their hedonic valence by distinguishing negative, positive, and neutral events (e. g., Filipp & Aymanns, 2009; Taylor, 1991). A popular assumption is that negative events have more negative and lasting consequences than positive events (e. g., Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). However, valence cannot account for the different effects that were found for the life events in Chapter 3. A central reason why valence might not be a suitable dimension is that it assumes a degree of objectivity that ignores the subjective meaning of the event for the concerned individuals (see Chapter 3 for a more detailed discussion).

A more promising approach was developed by Wilson and Gilbert (2008). They proposed that people adapt as soon as they find an explanation for the event, and provided a list of event features that might impede this explanation: novelty, surprise, variability, certainty, explanatory coherence and explanatory content. Most of these features are very subjective and can therefore not be applied to the results of this dissertation, with the exception of novelty: According to Wilson and Gilbert, events that are novel should elicit a greater hedonic reaction than events that have been experienced before. The study presented in Chapter 4 provided partial support for this hypothesis: The hedonic reaction to the second divorce was indeed less negative than the hedonic reaction to the first divorce, as would be predicted by Wilson and Gilbert. For unemployment, however, the magnitude of the reaction was similar across the three occasions. In sum, these findings suggest that novelty can explain differences in reaction and adaptation for some events, but not for all. The model by Wilson and Gilbert was published only recently, and systematic research examining its assumptions is scarce as of today. However, their model is a promising framework for future studies that attempt to develop a useful classification of life events.

5.2.3 How External are External Circumstances?

Headey and Wearing (1989, 1992) were among the first to propose that life events are partially influenced by the person. They distinguished between exogenous life events that are beyond the control of the individual, and endogenous events that are to some degree evoked by the individual. Headey and Wearing further proposed that the individual pattern of life events can be predicted by neuroticism, extraversion, and openness to experiences. Specifically, high neuroticism should be associated with a high number of negative events, high extraversion should be associated with a high number of positive events, and openness should be associated with a high total number of events of either valence. A number of subsequent studies showed that personality and life events are indeed related (e. g., Gomez, Krings, Bangerter, & Grob, 2009; Magnus, E. Diener, Fujita, & Pavot, 1993; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Saudino, Pedersen, Lichtenstein, McClearn, & Plomin, 1997).

The present dissertation supports the assumption that external circumstances have a dispositional component. In Chapter 2, the correlation between income and SWB was decomposed into its stable and occasion-specific components. The findings were consistent across the three samples: More than half of the covariance was due to stable influences, which indicates the existence of common dispositional variables that affect both constructs. Additional evidence for the partial endogeneity of external circumstances comes from the study on repeated life events (Chapter 4). In this study, individuals with one experience of the life event were compared to individuals with two or more experiences. Interestingly, these subgroups differed in their average life satisfaction scores even before the very first event occurred. Those who would be unemployed at least twice were less satisfied in the years before the first unemployment than those who would be unemployed only once. Similar effects were found for divorce and marriage. These findings are very difficult to explain with anticipatory effects (cf. Chapter 3) because it seems unlikely that people expect being divorced twice in life if they have not even gone through their first divorce. Rather, these findings suggest that dispositional variables have some influence on the occurrence of repeated life events.

A task for future research is to (a) identify the dispositional factors that generally affect external circumstances, (b) examine whether specific factors are more influential for some circumstances (e. g. specific life events) than for others, (c) explain the mechanisms by which dispositional factors and external factors are related and (d) examine the additive and interactive effects of dispositional and external factors on SWB. Based on the findings of this dissertation and previous research, it seems most promising to start with personality traits such as neuroticism. In the study on repeated life events (Chapter 4), neuroticism was associated with generally lower levels of life satisfaction and, more importantly, with a greater negative reaction to the negative events of unemployment and divorce. But other variables should also be examined. For instance, the link between income and SWB might be influenced by goals

and values (Kasser, Ryan, Couchman, & Sheldon, 2004) that could in turn affect whether people spend their money on materialistic or experiential goods (Carter & Gilovich, 2010). Finally, SWB itself should also be considered as a predictor of important life outcomes (Luhmann, Eid, Lucas, & E. Diener, 2010; Oishi & Schimmack, 2010).

5.2.4 Gender and Age Differences in Adaptation

A consistent finding in the studies by Lucas (2007) was that individuals vary considerable in the reaction and adaptation to life events. Currently, many researchers seek to identify the variables that account for these individual differences. This question was not the focus of the present dissertation, and therefore, psychological predictors of individual differences were not systematically examined (with the exception of neuroticism and extraversion in Chapter 4). However, some of the results suggest that for specific events, it might be worthwhile to consider demographic characteristics such as gender and age in future studies in this line of research.

Gender

Previous research has shown that on average, men and women are about equally happy: Women tend to experience more positive and more negative affect, but the overall affect balance is similar for men and women (Argyle, 2001; E. Diener et al., 1999; Myers & E. Diener, 1995; Nolen-Hoeksema & Rusting, 1999). In the present dissertation, gender did not account for any differences in reaction and adaptation to most life events that were examined in Chapter 3—with two exceptions: Samples with a higher proportion of men yielded more positive effect sizes for reemployment and more negative effect sizes for unemployment, respectively, indicating that these work events have a greater hedonic impact on men than on women. This finding was also supported in Chapter 4, where the effects of repeated unemployment were worse for men than for women. Thus, it seems that work is more central for the well-being of men than for the well-being of women. The most obvious explanation lies in the traditional roles of men and women, according to which men feed their families and women keep house. During unemployment women can adopt their traditional role. Men, by contrast, are more likely to feel "useless" which presumably impairs their self-esteem to a great extent.

In sum, it can be concluded that men and women do not generally differ with respect to how they react and adapt to life events. Gender differences only emerge when specific life events are considered. The present dissertation suggests that work-related events are perceived differentially by men and women, and it remains to be examined whether similar patterns can be found for other events not included in this dissertation.

Age

Longitudinal studies suggest that SWB increases slightly over the life span and declines steeply at the end of life (Gerstorf et al., 2008, 2010). More specifically, positive affect tends to increase somewhat with age (Charles, Reynolds, & Gatz, 2001), and life satisfaction was found to be highest at the age of 65 (Mroczek & Spiro, 2005). One suggested explanation for this effect was that older people adapt more successfully to changing life circumstances (e. g., Argyle, 2001).

This hypothesis cannot be fully supported in the present dissertation. Although age accounted for some of the differences in reaction and adaptation, the findings were rather inconsistent. For instance, older people reacted more negatively to unemployment in the study on repeated life events (Chapter 4), but more positive effect sizes (indicating higher SWB) were found in samples with higher mean age (Chapter 3). For marriage, the results of the meta-analysis indicated curvilinear effects of age on reaction and adaptation to this event: Higher- or lower-than-average mean age was associated with a more positive initial reaction and less decline over time. This curvilinear relationship might explain why no age effects were found in the repeated events study (Chapter 4) where only linear effects were examined.

In sum, these findings lead to a conclusion that is similar to the one for gender differences: Age does not seem to be associated with a generally better (or worse) ability to adapt to life events, but rather, the effects are very specific for some events. The divergent findings on unemployment might be explained by moderating influences such as contextual factors. For instance, the specific effect of unemployment on different age groups might be affected by how easy and how important it is for these age groups to find a new job. This depends on many factors such as the specific economic circumstances, the social system, or the general acknowledgment of older workers in the specific labor market. Culture is another contextual factor that might moderate age effects: Some life events are associated with a certain normative age at which it is normal to experience this event which means that these events have very different effects if they are experienced earlier or later than "normal". The normative age for specific life events such as marriage or child birth varies between different cultures; hence, culture could explain some of the findings.

In conclusion, the effects of age on reaction and adaptation to life events are probably influenced by a number of contextual factors. The availability of large-scale archival data sets from different countries offers an opportunity to examine these contextual factors more systematically in future studies.

5.3 Methodological Implications

The interpretation of previous studies on external circumstances and SWB was often hampered by methodological limitations. Of course, no methodological approach is without flaws, and sometimes,

the best methodological approach cannot be applied for practical reasons. Nonetheless, it is possible to derive some methodological implications from the results of this dissertation. In this section, implications for designs, samples, and assessment will be discussed.

5.3.1 Research Designs

All studies in the present dissertation were longitudinal and non-experimental. At this point, the appropriateness of longitudinal and experimental designs to study the short- and long-term relations between external circumstances and SWB will be discussed.

Longitudinal Designs

Change processes can only be analyzed if multiple measurements of the variable of interest are available. Hence, longitudinal studies are needed to study the short- and long-term effects of external circumstances on SWB. Longitudinal studies are time-consuming and expensive. It is therefore particularly important to develop a study design that is appropriate for the specific research objectives and, at the same time, economic. Among others, the time frame, the frequency of time points, and the time lags must be considered.

Of course, more measurement occasions are always better, but this is rarely compatible with the time and cost restraints that confine the researcher. Also, attrition rates tend to be higher in long-running studies. Therefore, the specific research objective needs to be considered. If the main interest is in the stability and variability, as few as three time points can be sufficient (e. g., Eid & E. Diener, 2004). However, more time points are often preferable for both substantive and statistical reasons.

Researchers examining the impact of distinct events on SWB are usually more interested in modeling the change process. In this case, it is essential to determine the expected rate and shape of the growth curve (Singer & Willett, 2003). A linear-change model can be fitted if at least three time points are available. However, the results in Chapter 3 suggest that non-linear growth curves are more probable. To model quadratic change, four measurements are the absolute minimum requirement, but more time points are preferable and even mandatory if more complex non-linear models shall be fitted. The expected shape of growth also affects the time lags between the measurements. If non-linear change is expected, the timing of the measurement occasions should fit the expected growth curve: The lags should be shorter at periods during which a lot of change is expected, and they can be longer when not many changes are expected. The findings of the meta-analysis (Chapter 3) showed that for most events, the greatest changes occur during the first year after the event. For this reason, studies on these specific life events should be set up so that most measurements take place during these twelve months.

Another important issue concerns the overall time frame of the study. Studies that examine adaptation to specific events should be prospective which means that at least one measurement should occur before the event. As many events are anticipated beforehand (A. E. Clark, E. Diener, Georgellis, & Lucas, 2008), multiple time points before the event are preferable in order to assess the trajectory of these anticipatory effects. Moreover, the study should at least cover the period when most of the adaptation occurs. Depending on the event, this can range from a couple of hours or days (e. g., for daily hassles or uplifts) to several years (e. g., for unemployment).

In this context, it might be worthwhile to consider the implementation of experience sampling studies (Hektner, Schmidt, & Csikszentmihalyi, 2007; Scollon, Kim-Prieto, & E. Diener, 2003). Experience sampling is a collective term for studies where participants are contacted repeatedly (e. g., several times a day) and asked to rate their momentary mood, the momentary circumstances, or other current states that are of interest to the researcher. Alternatively, participants can rate their states retrospectively with the day reconstruction method (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004) or, more economically, with the event reconstruction method (Grube, Schroer, Hentzschel, & Hertel, 2008). All of these methods allow a detailed monitoring of the short-term effects of external circumstances on SWB.

In sum, the study design should always be derived from theoretical assumptions on the expected changes. The findings presented in this dissertation, particularly in Chapter 3, might be helpful in this context. Given the finding that AWB is less stable than CWB, short-term studies with short time lags might be more appropriate to study AWB, whereas long-term studies with longer time lags might be more appropriate to study CWB.

Experimental Designs

The three studies in the present dissertation all suffer from the limitation that the causal direction cannot be tested. For instance, in Chapter 2, the positive (though very small) correlations of the occasion-specific effects only indicate that income and SWB both move in the same direction, controlling for stable, autoregressive, and lagged effects. Although it could be plausible that this is due to a causal effect of income changes on SWB, this causal hypothesis cannot be tested within the longitudinal design.

A rigorous test of causality requires experimental designs where (a) the independent variable (i. e., the expected cause) can be manipulated and (b) participants are randomly assigned to the experimental conditions (e. g., Harris, 2008). Some researchers have examined the effects of external factors on SWB experimentally (e. g., DeVoe & Pfeffer, 2009; Dunn, Wilson, & Gilbert, 2003), but overall, experimental research designs are rather scarce in this research field. The main reason for this is, of course, that the specific external circumstances that are of interest to SWB researchers are hard or, in some cases, impossible to manipulate in laboratory settings, and the external validity of laboratory experiments is rather low when the effects of external life circumstances on SWB are examined. For some specific

external circumstances, field experiments might be an alternative. But they definitely cannot be conducted to study the effects of major life events on SWB because basic ethical rules would have to be infringed. It is simply not possible to randomly assign individuals to conditions where those in one group get married, fired, or bereaved, and the ones in the other group do not. For this reason, the best design for life events studies is the longitudinal design as described above.

5.3.2 Samples

In contrast to most psychological research, the studies in the present dissertation were not based on samples of first-year college students. Rather, two out of three studies analyzed data from nationally representative panel studies, the SOEP and the BHPS. These panel studies have played a prominent role in SWB research of the past years, but they are not without limitations. At this point, the strengths and limitations of these and similar archival data sets shall be discussed, followed by some ideas on extending the samples to dyads or groups.

Strengths and Limitations of Archival Data

The term *archival data set* is used here as a summary term for those types of data sets that are available for researchers and have been collected by others. Most archival data sets consist of large samples. Large samples are advantageous for both substantive and methodological reasons. First, they offer the opportunity to examine very specific research questions, such as adaptation to rare life events. It would not have been possible to examine the effects of repeated life events (Chapter 4) if not for large-scale and long-running data sets that comprise so many participants that enough of them could experience these events multiple times during their participation in the study. Second, the statistical power in these studies is very high, making it possible to detect even very small effects. Of course, this also increases the probability to detect effects that might not be considered practically significant. For this reason, it is particularly important to report effect sizes in addition to inferential data. Third, many archival data sets are representative of specific subgroups or even the total population of a country. This is a major advantage over conventional psychological studies because the findings can be generalized to the total population, not only to a small subgroup of first year college students. Fourth, panel studies such as the SOEP or the BHPS often cover very long time frames. For instance, the SOEP is now in its 27th annual wave. These intensive longitudinal data sets allow examining a variety of questions on the stability and variability of psychological variables. Thus, such data are not only of interest to SWB researchers, but also to psychologists from other disciplines that are interested in life-span development. Finally, archival data have an important practical advantage: They have already been collected and set up, so researchers can start running their analyses as soon as they have formulated their research objectives.

After this plea for the use of archival data in psychological research, their limitations should of course not be concealed. A major concern is the data quality. For large-scale studies such as the SOEP and the BHPS, data collection and data management are well documented, giving the researcher the possibility to judge whether the quality of the data meets the standards. However, this might not be the case for other archival data sets. Moreover, even a good documentation is not a warranty for good data quality. For economic reasons, the number of items in these data sets must be kept to a minimum, which often leads to the use of very short scales. In the SOEP, the Big Five personality dimensions are assessed with very short scales that consist of three items, respectively. Although these scales replicate established longer scales (Gerlitz & Schupp, 2005), their validity remains an issue. For life satisfaction, the problem is even more evident: This variable is assessed with a single item, making it very difficult to assess its reliability (but see Schimmack, Krause, Wagner, & Schupp, 2010). Despite this limitation, this item has been used successfully in a wide range of psychological studies, including those presented in Chapters 2 and 4 of this dissertation.

A second limitation of archival data concerns the range of available variables. Many panel studies were originally designed for sociological and economic research objectives, and hence often lack variables that many psychologists would consider essential. This is changing now as more and more psychologists participate in the advancement of these studies. For instance, measures of mood, personality, locus of control, and other psychological constructs were implemented in the SOEP in the past years. But even despite these encouraging developments, archival data will never include all variables that might be of potential interest to researchers.

Thus, despite their strengths, archival data sets will probably not replace conventional studies with ad-hoc samples. Rather, they can be seen as important extensions for our research opportunities because they allow the examination of other research questions. In sum, a combination of panel studies and specifically designed ad-hoc studies will probably deliver the best results.

Beyond Individuals

In the majority of previous studies (including the ones in this dissertation), the relations between external circumstances and SWB were examined on the level of individuals. However, it can be assumed that most external circumstances do not only affect single persons, but also close ones in the social network. Some life events have direct effects on various persons; for instance, marriage, divorce, or child birth affect not only individuals, but couples. But even for those life events that are directly experienced by a single person, the rest of the family is likely to be involved: For instance, unemployment has a tremendous effect on the daily routines of all family members (Ström, 2003; Vinokur et al., 1996), including those who are not unemployed themselves. Also, as was shown in Chapter 3, health incidents such as a stroke or heart attack can have effects on the spouse's SWB.

In this context, it is not only interesting to examine how people react to life events that happen to a close relative or friend, but also to investigate how the interactive social relations might affect the adaptation process. This is related to the idea that social support might explain individual differences; however, examining dyads or families instead of individuals goes one step further. Multilevel models for dyads (Kenny, Kashy, & Cook, 2006) and small groups (Kenny, Mannetti, Pierro, Livi, & Kashy, 2002) are statistical tools that facilitate the investigation of these kinds of research questions. Finally, a recent study showed that loneliness is contagious and spreads in social networks (Cacioppo, Fowler, & Christakis, 2009). It would be interesting to examine whether similar effects could be found for SWB.

5.3.3 Assessment

Subjective well-being is usually assessed with self-report measures, also in this dissertation. The main reason for this is the fundamental assumption that well-being is inherently subjective and therefore can best be assessed through introspection. To date, a number of reliable and validated self-report measures exist (Pavot, 2008), for instance, the widely used Satisfaction With Life Scale (E. Diener, Emmons, Larsen, & Griffin, 1985; Pavot & E. Diener, 1993) and the Positive Affect Negative Affect Schedule (Watson, L. A. Clark, & Tellegen, 1988). However, self-reports of SWB have not gone without critique. For instance, Schwarz and Strack (1999) suggested that self-reports might be biased by irrelevant factors such as the order in which the items are presented. Subsequent studies have shown that these effects are very small (e. g., Eid & E. Diener, 2004; Schimmack & Oishi, 2005), but this should not be taken as a justification to not consider other assessment methods. Applying a multimethod approach can often lead to a more complete understanding of the structure and correlates of psychological variables (Eid & E. Diener, 2006), and SWB is certainly no exception to this.

Thus, researchers should consider assessing SWB with other assessment methods in addition to self-reports, for instance, informant reports, implicit measures, or physiological measures. *Informant reports* could be very interesting in the context of major life events. Do the reports of family members, friends, or colleagues diverge from the reports of the affected persons themselves? And if so, do these divergences predict the magnitude of the reaction and the rate of adaptation to the event? In the past decade, *implicit measures* have stimulated research in many fields of psychology (e. g., Gawronski & Payne, 2010; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). Recently, an implicit measure of SWB was introduced (Walker & Schimmack, 2008). This measure could be an attractive alternative to self-reports of SWB because it is less likely to be biased by response styles or other factors, yet at the same time accounts for the subjectivity of SWB. Finally, *psychophysiological measures* have successfully been used in research on emotions (Larsen & Prizmic-Larsen, 2006) and stress (Denson, Spanovic, & Miller, 2009). Their application might help us to understand why external circumstances affect AWB and CWB differentially.

In sum, multimethod measurement allows researchers to examine external circumstances and SWB on multiple levels of analysis (Berntson & Cacioppo, 2006) which might eventually lead to a better understanding of their complex relations.

5.4 Practical Implications

Recent research suggests that happiness can, to some degree, be changed (e. g., E. Diener et al., 2006). This finding has stimulated the development of interventions that aim at increasing SWB sustainably: On the one hand, individual interventions provide tools that each person can apply to become happier. On the other hand, public policy interventions aim at increasing the SWB at the societal level.

5.4.1 Individual Interventions

An important field within SWB research is concerned with the development and evaluation of interventions that increase individuals' level of SWB (e. g., King, 2008; Lyubomirsky, 2007; Lyubomirsky, Sheldon, & Schkade, 2005). Most of the proposed interventions aim at peoples' goals and activities which are supposed to be less prone to adaptation than external circumstances (Sheldon & Lyubomirsky, 2006). Empirical studies offer support for the effectiveness of these kinds of interventions (for a meta-analytic review, see Sin & Lyubomirsky, 2009).

The present dissertation delivers two implications that might be relevant for the further development of individual happiness interventions. First, it was shown that AWB and CWB differ in their associations with external circumstances. It can be speculated whether similar effects can be found when their relations to goals and activities are considered. If this is the case, it might be necessary to develop differential interventions that aim at increasing either AWB or CWB. Second, the results suggest that the effects of external circumstances on SWB might have been underestimated. People do, on average, adapt to life events, but the rate of adaptation is slower than previously assumed (Suh et al., 1996). Thus, there might be more potential to increase SWB via external circumstances than it is currently assumed.

5.4.2 Public Policy Interventions

In 2008, at the height of the recent financial and economic crisis, French president Nicolas Sarkozy initiated a scientific commission that examined whether indicators of well-being should supplement conventional economic indicators to evaluate a country's welfare (Stiglitz, Sen, & Fitoussi, 2009). This is just one example of how public and political attention for subjective well-being has increased in the past years. These developments have important implications for public policy interventions because

they imply that these interventions should not (only) stimulate economic growth, but also national well-being.

Most public policy interventions aim at changing peoples' external circumstances (for more extensive discussions, see E. Diener, Lucas, Schimmack, & Helliwell, 2009; Schimmack, 2006), so it is particularly relevant to examine whether these changes can have short- or long-term effects on SWB. The results of this dissertation indicate that providing people with more money, for instance by lowering income tax rates, is probably not enough. In Chapter 2, occasion-specific fluctuations in income were only very weakly correlated with changes in SWB, and it is not even sure if this correlation reflects an underlying causal effect of income on SWB. So instead of focusing exclusively at peoples' incomes, it might be more effective to implement policy interventions that aim at preventing unemployment. Two studies in the present dissertation have indicated that the effects of unemployment on SWB are severe and that adaptation is slow.

The present dissertation also has implications for the development of national well-being indicators (E. Diener & Seligman, 2004): The results suggest that public policy interventions might be more effective in increasing peoples' CWB, whereas their AWB is likely to be unaffected. Policy makers might therefore put more emphasis on indicators that focus on the cognitive aspects of SWB because these are more likely to detect changes in peoples' SWB due to public policy interventions.

5.4.3 Conclusion

Individual and public policy interventions to increase SWB are still a very new field of research, but the first results are promising. To conclude this section, two very general questions shall be raised:

Should we increase SWB? This question has moved philosophers, scientists, politicians, and religious leaders for centuries (King, 2008; McMahon, 2006; Oishi & Koo, 2008). Several empirical studies suggest that high SWB has positive consequences: Happy people are more likely to get and stay married, to be successful in their jobs, and to earn more money (e. g., Lyubomirsky, King, & E. Diener, 2005; Oishi, E. Diener, & Lucas, 2007). These results indicate that it might be beneficial for societies to increase their peoples' SWB. However, one study indicated that the optimum level of SWB could actually be slightly *below* its possible maximum, at least when work outcomes are considered (Oishi et al., 2007). Thus, more happiness might not always be better. But even if there was general agreement that SWB should be increased, this dissertation provokes a second question:

Which type of SWB should be increased? The present findings indicate that different interventions are needed to increase AWB and CWB. Of course, these are just preliminary findings that must be replicated in the future (but see E. Diener et al., 2010, for similar findings). However, if this assumption was supported, everyone who develops or implements SWB interventions must decide which component

of SWB should be increased. Do we want people to be more satisfied or do we want them to experience more positive affect and less negative affect? Empirical scientists can gather data that might help to reach a decision, but finding the ultimate answer to this question is a task for philosophers, politicians—and for every individual person.

5.5 Conclusion and Directions for Future Research

In the present chapter, the results of this dissertation were summarized and integrated. A variety of directions for future research were proposed. To conclude, the most important and the most promising avenues for future research on external circumstances and SWB will be outlined:

(1) *Differentiating between the components of SWB*. This dissertation has shown that the relations between external circumstances and SWB differ for different components of SWB. Here, future studies should strive to determine the underlying mechanisms that account for these differences. In addition, it might be worthwhile to go another step further by examining the respective components of CWB and AWB, for instance, satisfaction with specific domains such as job satisfaction, and specific emotions such as anger or joy. Each of these components might be affected differentially by external circumstances, and very different patterns of reaction and adaptation might be observed.

(2) *Classifying life events*. Life events have very different effects on SWB, and to explain why, a systematic classification of events is needed. For this purpose, more longitudinal studies on a whole range of life events are needed. This includes studies on relatively rare events such as natural disasters, but also studies on smaller common events in work and private life such as passing or failing an important exam or going on vacation.

(3) *Explaining individual differences*. People differ substantively in how they react and adapt to changes in external life circumstances. To explain these differences, dispositional variables (e. g., personality, coping strategies, habitual SWB, age) and contextual variables (e. g. social relations, economic background) need to be considered. Also, cross-cultural studies are valuable in this context in order to determine the generalizability of the findings on reaction and adaptation.

(4) *Research on specific life events*. For some events examined in this dissertation, the results were particularly interesting and merit further research. For instance, different effects of short-term, long-term, and repeated unemployment should be examined.

(5) *Methodological innovations*. Finally, future studies on these topics should use prospective longitudinal data and multimethod approaches to measure SWB.

A current question in SWB research is which external circumstances can have short- or long-term effects on SWB. The present dissertation has shown that income and major life events are unlikely to

change how people *feel* about their lives—but they can, to some extent, influence how people *think* about their lives.

5.6 References

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6 LIST OF TABLES

7 LIST OF FIGURES

8 APPENDIX (IN GERMAN LANGUAGE)

8.1 Zusammenfassung in deutscher Sprache

Sind reiche Menschen glücklicher? Wie lange dauert es, bis man sich nach einer Hochzeit wieder auf seinem ursprünglichen, „normalen" Glücksniveau befindet? Und fühlt sich die zweite Arbeitslosigkeit genauso an wie die erste? Dies sind einige der Fragen, die in der vorliegenden Dissertation beantwortet werden.

Die psychologische Glücksforschung beschäftigt sich mit den Prädiktoren und Konsequenzen des subjektiven Wohlbefindens (SWB). Dabei handelt es sich um ein breites Konstrukt, das sowohl affektive als auch kognitive Komponenten umfasst. Das affektive Wohlbefinden bezieht sich auf die Häufigkeit und Intensität von Stimmungen und Emotionen, während das kognitive Wohlbefinden die Beurteilung des eigenen Lebens beschreibt (Diener, 1984). Eine klassische Theorie des SWB besagt, dass das momentane Wohlbefinden um einen Set-Point schwankt, der über längere Zeiträume stabil und von teilweise vererblichen Eigenschaften wie der Persönlichkeit determiniert ist (z. B. Brickman et al., 1978; Headey & Wearing, 1989; Lykken & Tellegen, 1996). Eine zentrale Annahme dieser Theorie besagt, dass externe Lebensumstände nur eine sehr geringe Rolle für das Wohlbefinden spielen. Demnach können Veränderungen in den externen Lebensumständen (z. B. Einkommenserhöhungen, Heirat oder Arbeitslosigkeit) sich zwar kurzfristig auf das Wohlbefinden auswirken, aber schon nach einigen Monaten kehrt das Wohlbefinden der Betroffenen zum Set-Point zurück – anders ausgedrückt: Menschen adaptieren schnell und zwangsläufig, sowohl an positive als auch an negative Veränderungen.

Neuere Forschungsergebnisse deuten allerdings darauf hin, dass die Bedeutung externer Lebensumstände für das Wohlbefinden in der Vergangenheit unterschätzt wurde (Diener et al., 2006). So wurde beispielsweise gezeigt, dass bestimmte Lebensereignisse wie der Tod des Ehepartners oder Arbeitslosigkeit sehr langfristige Auswirkungen auf das SWB haben können (Lucas et al., 2003, 2004). Damit stellt sich die Frage, welche externen Lebensumstände kurzfristige, und welche langfristige Veränderungen des Wohlbefindens bewirken können.

Ziel der vorliegenden Dissertation ist es, die kurz- und langfristigen Beziehungen zwischen SWB und Einkommen (Kapitel 2), einzelnen Lebensereignissen (Kapitel 3) und wiederholten Lebensereignissen (Kapitel 4) zu untersuchen. Diesen externen Lebensumständen ist gemeinsam, dass ihre Auswirkungen auf das Wohlbefinden lange Zeit unterschätzt wurden (z. B. Diener et al., 1999; Myers & Diener, 1995). Bei näherer Betrachtung der dieser Annahme zugrundeliegenden Studien stellt sich jedoch heraus, dass die empirischen Befunde nicht immer so klar und eindeutig interpretierbar waren, wie häufig behauptet wurde. Beispielsweise korrelieren Einkommen und SWB zu etwa .20. Im Vergleich zu anderen

Zusammenhängen in der Psychologie mag das kein großer Effekt sein. Betrachtet man stattdessen jedoch Mittelwertsunterschiede, so zeigen sich erhebliche Unterschiede zwischen Armen und Reichen (Lucas & Schimmack, 2009). Diese Studie zeigt beispielhaft, dass korrelative Zusammenhänge zwischen externen Faktoren und SWB sehr vorsichtig interpretiert werden müssen und andere Methoden vorzuziehen sind. Hier setzt die vorliegende Dissertation an.

Kapitel 2 beschäftigt sich ebenfalls mit dem Zusammenhang zwischen Einkommen und Wohlbefinden. Hier wurde untersucht, ob dieser Zusammenhang eher durch stabile individuelle Unterschiede oder durch kurzfristige, messzeitpunktspezifische Fluktuationen erklärt werden kann. Diese Fragestellung wurde sowohl hinsichtlich des affektiven Wohlbefindens als auch hinsichtlich des kognitiven Wohlbefindens untersucht. Der Zusammenhang zwischen Einkommen und affektivem Wohlbefinden wurde in einer Stichprobe der British Household Panel Study (BHPS; N = 37,041) modelliert. Der Zusammenhang zwischen Einkommen und kognitivem Wohlbefinden wurden ebenfalls in einer Stichprobe der BHPS untersucht (N = 31,871) sowie zusätzlich in einer Stichprobe des Sozioökonomischen Panels (SOEP, N = 43,565). Um stabile und messzeitpunktspezifische Einflüsse zu trennen, wurden diese Längsschnittdaten mit bivariaten Latent-State-Trait-Modellen analysiert. Mit diesen Modellen war es möglich, (a) die Korrelation zwischen den stabilen Faktoren, (b) die Korrelation zwischen den messzeitpunktspezifischen Faktoren sowie (c) den relativen Einfluss der stabilen und messzeitpunktspezifischen Determinanten auf den Zusammenhang zwischen Einkommen und Wohlbefinden zu bestimmen. Die in dieser Dissertation berichtete Studie ist die erste, die den Zusammenhang zwischen Einkommen und Wohlbefinden mit bivariaten Latent-State-Trait-Modelle analysiert. Die Korrelationen zwischen den stabilen Faktoren waren in allen Stichproben moderat, während die Korrelationen zwischen den messzeitpunktspezifischen Faktoren sehr klein ausfielen. Insgesamt erklärten die stabilen Faktoren zwischen 60 und 90 % der gesamten Kovarianz zwischen Einkommen und Wohlbefinden. Diese Ergebnisse lassen sich dahingehend interpretieren, dass die Beziehung zwischen Einkommen und SWB vor allem durch stabile, dispositionale Faktoren bedingt ist, die in zukünftigen Studien näher untersucht werden müssen.

Eine zentrale Annahme der Set-Point-Theorie des Wohlbefindens ist die Adaptationshypothese. Sie besagt, dass sich Menschen sehr schnell an veränderte Lebensumstände anpassen. In früheren Studien wurde geschätzt, dass der Adaptationsprozess schon nach wenigen Monaten abgeschlossen ist (Suh et al., 1996). Diese Hypothese wurde in Kapitel 3 metaanalytisch überprüft. Dazu wurden Längsschnittdaten aus 247 Publikationen (396 Stichproben, 992 Effektgrößen, N = 82,893) zu fünf Familienereignissen (Hochzeit, Scheidung, Trauerfall, Geburt eines Kindes und gesundheitliche Probleme eines nahen Verwandten) und fünf Arbeitsereignissen (Arbeitslosigkeit, Wiederbeschäftigung, Renteneintritt, andere arbeitsbedingte Veränderungen sowie Umzug bzw. Migration) aggregiert. Für jedes Ereignis wurden die folgenden drei Fragen beantwortet: (1) Wie groß ist der sofortige Effekt des Ereignisses auf das Wohl-

befinden? (2) Wie sieht der Verlauf der Adaptation über die Zeit aus? (3) Wirken sich die Lebensereignisse unterschiedlich auf affektives und kognitives Wohlbefinden aus? Für die meisten Ereignisse wurden Adaptationseffekte nachgewiesen, aber es zeigte sich auch, dass der Adaptationsprozess teilweise wesentlich länger dauert als zuvor angenommen. Zudem fielen die Effekte für die einzelnen Ereignisse sowie für affektives und kognitives Wohlbefinden sehr unterschiedlich aus. Affektives Wohlbefinden war in der Regel weniger stark vom Ereignis beeinflusst.

Während in Kapitel 3 die Auswirkungen *einzelner* Lebensereignisse untersucht wurden, handelte Kapitel 4 von den Auswirkungen *wiederholter* Ereignisse. Hier ging es um die Frage, ob sich Ereignisse unterschiedlich auswirken, wenn sie mehrmals erlebt werden. Dazu wurden die Auswirkungen von wiederholter Arbeitslosigkeit, wiederholter Scheidungen sowie wiederholter Hochzeiten auf die Lebenszufriedenheit untersucht. Die Stichproben wurden aus dem SOEP genommen, das bereits in Kapitel 2, dort aber in einem anderen Zusammenhang, verwendet wurde. Die Stichprobengrößen waren N = 3,350 für wiederholte Arbeitslosigkeit, N = 921 für wiederholte Scheidungen und N = 1,950 für wiederholte Hochzeiten. Um Effekte auf der intra- und der interindividuellen Ebene simultan betrachten zu können, wurden die Daten mit Mehrebenenmodellen analysiert. Für wiederholte Arbeitslosigkeit wurde ein so genannter Sensibilisierungseffekt gefunden, das heißt, die Lebenszufriedenheit nahm mit jeder neuen Arbeitslosigkeit weiter ab. Im Gegensatz dazu fand sich für wiederholte Scheidungen ein so genannter Adaptationseffekt, das heißt, die Lebenszufriedenheit war zum Zeitpunkt der zweiten Scheidung höher als zum Zeitpunkt der ersten Scheidung. Für wiederholte Hochzeiten fand sich kein Unterschied. Zusätzlich zu diesen mittleren Effekten wurden auch die Einflüsse mehrerer Moderatorvariablen untersucht, die interindividuelle Unterschiede in den Reaktionen vorhersagten. Deutlichen Erklärungswert hatten Neurotizismus, Extraversion und das Geschlecht. Beispielsweise waren Frauen sowohl bei wiederholter Arbeitslosigkeit als auch bei wiederholter Scheidung im Mittel zufriedener als Männer. Zusammengefasst zeigen die Ergebnisse dieser Studie, dass sich wiederholte Erfahrungen mit demselben Ereignis sehr unterschiedlich auf die Lebenszufriedenheit auswirken können.

Die wichtigsten Befunde dieser Dissertation lassen sich wie folgt zusammenfassen: (1) Externe Lebensumstände haben stärkere Auswirkungen auf das kognitive Wohlbefinden als auf das affektive Wohlbefinden. (2) Verschiedene Lebensereignisse haben sehr unterschiedliche Effekte auf das Wohlbefinden. (3) Externe Umstände sind zumindest teilweise von dispositionalen Eigenschaften der Personen beeinflusst. In dem abschließenden Kapitel dieser Dissertation werden die Befunde der drei Studien integriert und hinsichtlich ihrer theoretischen, methodischen und praktischen Implikationen diskutiert.

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8.2 Lebenslauf

Der Lebenslauf ist in der Online-Version aus Gründen des Datenschutzes nicht enthalten.

8.3 Erklärung

Hiermit versichere ich, dass ich die vorgelegte Arbeit selbständig verfasst habe. Andere als die angegebenen Hilfsmittel habe ich nicht verwendet. Die Arbeit ist in keinem früheren Promotionsverfahren angenommen oder abgelehnt worden.

Berlin, Juli 2010 Maike Luhmann