JUDGMENTS OF LIFE SATISFACTION:
THE ROLE OF NEGATIVITY AND LIFE EVENTS

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By

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Abstract

The dissertation addresses the role of negativity and life events in life satisfaction judgments. Specifically, the reported research examined how *domain negativity* influences the relationship between domain satisfactions and life satisfaction and how the *transition into parenthood* alters the course of life satisfaction and domain satisfactions over time. The work, thereby, combines both a) nationally representative *survey data* to demonstrate strong and reliable *effects* and b) *experimental data* to examine the underlying psychological *mechanism*.

Based on theorizing on a general negativity bias, Paper 1 investigated whether negative compared to positive domain satisfactions particularly influence life satisfaction judgments. Relying on a nationally representative sample of the German population (Socio-Economic Panel), the findings strongly supported that the more negative the domain satisfaction, the more pronounced was the relation between the respective domain satisfaction and overall life satisfaction. The pronounced impact emerged when negativity was assessed relative to other domains a) within and b) between participants as well as when negativity was assessed c) relative to prior satisfaction with the same domain.

Building on the strong and reliable negativity effect demonstrated in Paper 1, Paper 2 specifically examined whether accessibility serves as an underlying mechanism of the pronounced impact of negative domain satisfactions on life satisfaction. Therefore, accessibility of a specific domain, here health satisfaction, was systematically manipulated in healthy and unhealthy individuals by varying the question order in a self-generated online-survey in which the two satisfaction items (general and health) were assessed. Results demonstrated that accessibility can explain the pronounced impact of domain negativity in life satisfaction judgments.

Beside the influence of negativity in specific life domains, life satisfaction can also be influenced by critical life events. Paper 3, therefore, examined the differential effects of transition into parenthood on domain satisfactions and life satisfaction. Using lag and lead

regression models in the Socio-Economic Panel, evidence for differential and dynamic effects of childbirth on satisfaction variables appeared, such as reversed u-shaped anticipation and adaptation processes, as well as stable decreases and stable increases. Additionally, gender and women's employment status strongly modified the satisfaction trajectories.

More generally, the dissertation demonstrates that life satisfaction judgments do not necessarily reflect stable judgments, but that those judgments are influenced by domain negativity and by critical life events.

Preface

This dissertation is based on three articles which have been published or submitted, or are ready to be submitted for publication in peer-reviewed journals. The articles are listed below.

Engel, J. & Bless, H. (2017). The more negative the more impact: Evidence from nationally representative data on the relation between domain satisfactions and general life satisfaction. *Social Psychology*, *48,* 148–159. doi: 10.1027/1864-9335/a000305. Current Impact Factor: 2.602.

Engel, J. (2017). Experimental evidence on the relation between specific domain satisfactions and overall life satisfaction: Why negative domains exert a particular influence.

Engel, J. & Bless, H. (2017). Lag and lead effects of critical life events - Now you see them, now you don't: Effects of childbirth on life satisfaction and domain satisfactions (submitted).

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Contents

1 Overview

Life satisfaction judgments reflect people's overall evaluation of the quality of their life (Diener, Suh, Lucas, & Smith, 1999). Over the last two decades, life satisfaction has been of interest to psychologists (e.g., Diener, 2012; Diener, Oishi, & Lucas, 2003; Lyubomirsky, 2001). Even beyond the scope of psychological research, judgments of life satisfaction have rightly become the gold standard in the measurement of subjective well-being. Reports of life satisfaction are commonly used in international and influential surveys (e.g., World Values Survey, General Social Survey, Socio-Economic Panel), by national statistic offices (e.g., in the United Kingdom; Office for National Statistics, 2015), as well as by important organizations (e.g., Organization for Economic Co-operation and Development; OECD, 2013). Life satisfaction measurements have also been discussed as indicators of the fairness of economic and political systems that could guide political decisions, for example, in the United Kingdom (Matheson, 2011) or in France (Stiglitz, Sen, & Fitoussi, 2009). In this respect, Diener and Seligman (2004), for example, argued that beyond economic indicators, such as the Gross Domestic Product, which is usually used to assess national prosperity, measures of life satisfaction should influence policy decisions more strongly.

And, indeed, self-reported life satisfaction judgments have some validity. The validity of life satisfaction measurements is inferred from observed associations to other measurements related to comparable constructs (*convergent validity*) and associations to non-self-reported measurements of well-being; as well as, most importantly, the ability of life satisfaction measurements to *predict* important outcomes. In this respect, the measurement of life satisfaction (e.g., Satisfaction with Life Scale; Diener, Emmons, Larsen, & Griffin, 1985) shows good convergent validity with other scales of subjective well-being. It also converges with other types of assessment, such as expert ratings, experience sampling measures, and physiological responses (Sandvik, Diener, & Seidlitz, 1993). Furthermore, life satisfaction

predicts important outcomes, such as health, longevity, social relationships, and work-related outcomes. For example, happy and satisfied people are more active and more sociable, behave more altruistically, and have a stronger body and immune system (Lyubomirsky, King, & Diener, 2005).

Due to the great interest in and wide-spread use of self-reported life satisfaction measures, it is important to know *how* individuals form their judgments and what factors influence and consequently have the potential to bias individuals' life satisfaction judgments. This dissertation centers on two important factors that might impact satisfaction judgments - *domain negativity* and *life events*.

Satisfaction with specific domains, such as satisfaction with family life, health, job, or income, have a strong impact on overall life satisfaction (Heller, Watson, & Ilies, 2004). But which weighs more: domains with which we are satisfied or domains with which we are unsatisfied? Generally, a systematic bias toward the negative often emerges, and negative information is considered as more influential than positive (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001). This negativity bias has been demonstrated in various research areas, and the present research examines whether this bias also holds true in life satisfaction judgments. Specifically, the present work focuses on the relationship between different domain satisfactions and life satisfaction, and whether negative domains are overrepresented in the overall life satisfaction judgment.

The present research does not only focus on whether or not an *effect* emerges, it also investigates *why* it occurs. What underlying mechanism can explain the pronounced impact of domain negativity? Examining this research question particularly refers to how people consider, weigh, and integrate information when asked to report a judgment about their life satisfaction. From a social cognition perspective reports of life satisfaction judgments are not necessarily stable reports of internal states (Schwarz & Strack, 1991). Often, satisfaction judgments are developed at the time the question is asked (Schwarz & Strack, 1999). When

forming the satisfaction judgment, individuals also do not always consider all information that might be theoretically relevant for the overall judgment. Individuals, in fact, truncate their search process as soon as enough information has come to mind to make a judgment (Schwarz & Strack, 1999). Therefore, from a social cognition perspective, life satisfaction judgments primarily represent individuals' most accessible information (Schwarz & Strack, 1999). In line with this theorizing, the present research directly examines whether the relationship between overall life satisfaction and specific domain satisfactions is a function of negativity and whether negativity is due to a pronounced accessibility of the negative domains in judgment formation.

Life satisfaction judgments are usually treated as valid indicators and measures of a person's well-being and, therefore, should be stable over time, at least to some degree. Undeniably, life satisfaction and domain satisfactions tend to be relatively stable over time (Diener, Lucas, & Scollon, 2006), but levels still may vary due to critical life events (Lucas, 2007a; Luhmann, Hofmann, Eid, & Lucas, 2012). Life events can cause temporary and sometimes long-lasting changes in life satisfaction (Clark, Diener, Georgellis, & Lucas, 2008; Lucas, 2005). A critical life event, in the long list of possible life events, constitutes the transition into parenthood, or to put it differently, the birth of the first child. For the overall judgments or an overall sample, parents' trajectories have mostly been described as reversed u-shaped courses, reflecting both anticipation and adaptation to the transition into parenthood (Clark et al., 2008; Frijters, Johnston, & Shields, 2011). However, the effects of childbirth not only pertain to the overall evaluation of one's life, but can also spillover to other life domains. Moreover, effects of childbirth are very likely to differ between men and women, and in women who are either employed, unemployed, or have a changing employment status. In this respect, the present research directly examines differential effects of the birth of the first child on a) different facets of satisfaction judgments and in b) different subgroups.

Following the introduction, the dissertation starts with the theoretical background of life satisfaction judgments, including a definition of subjective well-being, life satisfaction, and domain satisfactions (Chapter 2.1). Chapter 2.2 puts the spotlight on the influence of domain negativity on life satisfaction judgments, whereby Chapter 2.2.1 provides a general overview of the relationship between specific satisfactions and general satisfaction, and Chapter 2.2.2 takes a closer look at selected research examples, rendering the influence of negativity bias on this relationship very likely. Then, Chapter 2.2.3 focuses on a description of the judgmental model of subjective well-being (Schwarz & Strack, 1999), addressing the role of accessibility in the domain satisfaction-life satisfaction relationship. Chapter 2.2.4 provides a synthesis of the role of the abovementioned principles and describes the role of negativity and accessibility in the domain satisfaction-life satisfaction relationship. Chapter 2.3 will introduce the reader to theory and research on the effect of life events on life satisfaction and domain satisfactions over time. Chapter 2.3.1 specifically addresses the effect of the birth of the first child on life satisfaction, and Chapter 2.3.2 and Chapter 2.3.3 refer to differential effects of childbirth on different domain satisfactions and in different subgroups.

Research questions and hypotheses for both the influence of domain negativity and life events are presented in Chapter 3. Chapter 4 reviews the respective research papers. Whereas Chapter 4.1 and Chapter 4.2 summarize two multi-study papers addressing the role of negativity in life satisfaction judgments (Paper 1 and Paper 2), Chapter 4.3 recaps a paper directly examining the adaptation and anticipation effects of transition into parenthood on life satisfaction and domain satisfactions (Paper 3). Chapter 5, finally, presents the lessons learned from the studies and points out limitations and future directions for research.

The general overview (Chapter 2 to Chapter 5) is complementary to the three research papers (Chapter 6.1 to Chapter 6.3) and does not merely paraphrase them. This has implications. Parts of the general overview will only briefly refer to theory and relevant empirical evidences, which are thoroughly presented in the papers. On the other hand, the overview goes beyond the research papers and discusses more general aspects and broader theoretical embedding of the research which are, for the sake of stringency and comprehensibility, not covered in the research papers.

Together the three research papers and the general overview provide a) a short and comprehensive summary of the research as well as b) an integration into a broader context that relates the present research to the bigger picture.

2 Theoretical Background

2.1 What is Satisfaction?

Individuals can evaluate their life in terms of global judgments (overall satisfaction with life in general), in terms of focal judgments about specific domains of their life (e.g., satisfaction with the domain of health, job, income, or family life), or in terms of emotional feelings (positive and negative affect). Life satisfaction, domain satisfactions, and affect are all measures of the higher-order construct of subjective well-being (e.g., Diener, 1984; Diener et al., 1999; Eid & Larsen, 2007). Whereas life satisfaction and domain satisfactions refer to the *cognitive* component of subjective well-being - this is how individuals *think* about their life in general or about specific parts of their life - positive and negative affect refer to the *affective* component of subjective well-being - this is how individuals *feel* about their life.

Although the cognitive and the affective component of subjective well-being are correlated, researchers have found that these components differ in stability and variability over time (Eid & Diener, 2004) and show different relationships with other variables (e.g., Andrews & Withey, 1976; Lucas, Diener, & Suh, 1996; Schimmack, Schupp, & Wagner, 2008). For example, income is more strongly associated with life satisfaction compared to

affect (Diener, Tay, & Oishi, 2013; Kahneman & Deaton, 2010), whereas neuroticism is more strongly associated with affect (Schimmack et al., 2008). Considering employment status, unemployed people are significantly less satisfied with their life than employed people, but they do not differ in their affective well-being (Knabe, Rätzel, Schöb, & Weimann, 2010).

In acknowledging these potential differences between the cognitive and the affective component of subjective well-being, the present research focuses on the cognitive component for two main reasons. First, the theoretical model addressing the formation of subjective well-being judgments primarily refers to reports of life satisfaction, not to emotions (e.g., Schwarz & Strack, 1999). Second, life satisfaction, not affect, has become the gold standard in the measurement of subjective well-being and is an important indicator in surveys, statistic offices, and organizations, as described earlier. Please note that results and respective conclusions can only be applied to the cognitive component and cannot be generalized, of course, to the affective component of subjective well-being or broader constructs of individuals' well-being, such as meaning in life.

2.2 The Influence of Domain Negativity on Life Satisfaction Judgments

2.2.1 The Domain Satisfaction-Life Satisfaction Relationship

Domain satisfactions are strongly and positively related to overall life satisfaction (Heller et al., 2004). For example, the authors demonstrated that life satisfaction, on average, correlated $r = .51$ with marital satisfaction, $r = .44$ with job satisfaction, $r = .43$ with social satisfaction, and $r = .35$ with health satisfaction. Further support for substantial correlations between domain satisfactions and life satisfaction was provided by Diener and Diener (1995). Their cross-cultural studies indicated that domain satisfactions and life satisfaction correlated across 31 different nations.

Whereas there has been broad agreement on the fact that life satisfaction and domain satisfactions are strongly correlated, the causal direction has been controversially discussed in

the literature - referred to *bottom-up* versus *top-down* theories.[1] Do domain satisfactions influence overall life satisfaction, or does life satisfaction influence all domain satisfactions? To date, there has been little agreement on the causal chain of domain satisfactions and life satisfaction (Headey, Veenhoven, & Wearing, 1991). In bottom-up theories, specific domain satisfactions cause overall life satisfaction (Schimmack, 2007). For example, individuals with high marital satisfaction would also have a high life satisfaction because their marital satisfaction would influence their general life evaluation directly. By contrast, top-down theories predict the reverse direction of causality and explain causation from high order elements down to lower levels (Schimmack, 2007). According to this view, overall life satisfaction influences domain satisfactions. For example, individuals who are generally satisfied with their life would also evaluate various life domains more positively. As a consequence, only bottom-up theories would predict that changes in domain satisfactions produce changes in overall life satisfaction, whereas changes in domain satisfactions would not change overall life satisfaction according to top-down theories. It is difficult to determine whether the relationship between domain satisfactions and life satisfaction is due to a bottom-up or a top-down process (Headey et al., 1991). Andrews and Withey (1976), for example, proposed that an increase in income may first increase financial satisfaction, and financial satisfaction may, in turn, increase overall life satisfaction and then, as a consequence of an increase in overall life satisfaction, other domain satisfactions increase in turn. Thus, both processes may operate over time.

Despite evidence for a general positive and strong correlation, leaving the discussion about the causal direction behind us, the specific nature of the domain-overall satisfaction relationship can be moderated by other variables. For example, values such as power,

[1] Please note that the terms of bottom-up and top-down theories here refer to the causal direction between domain satisfactions and life satisfaction only; other researchers also used bottom-up and top-down theories in broader terms referring to the discussion of the influence of personality versus environmental influences on life satisfaction (e.g., Diener, 1984).

achievement, tradition, and conformity moderate the relationship between specific domain satisfactions and life satisfaction (Oishi, Diener, Suh, & Lucas, 1999). For example, individuals who stress values of benevolence showed a stronger relationship between overall satisfaction and satisfaction with social life than individuals low in values of benevolence. Similarly, early subjective well-being research also identified various demographic variables, such as age or gender, that moderate the relationship between specific domain satisfactions and general life satisfaction (Andrews & Withey, 1976; Campbell, 1976; Campbell, Converse, & Rodgers, 1976).

2.2.2 Negativity Bias in Life Satisfaction Judgments

As shown in Chapter 2.2.1, various variables can weaken or strengthen the relationship between domain satisfactions and life satisfaction. The following two examples likewise describe two moderating variables influencing this relationship, however, the examples specifically point to initial evidence of a negativity bias in the *domain satisfaction-life satisfaction relationship*.

First, with respect to the domain of finances and income, *financial satisfaction* correlates more strongly with overall life satisfaction in individuals living in poorer compared to richer countries (Diener & Diener, 1995; see also Veenhoven, 1991). In light of the assumption that individuals in poorer countries are more dissatisfied with their financial situation, the observed findings support the notion that domains with low satisfaction are particularly associated with overall life satisfaction.

The second example pertains to the domain of health. *Satisfaction with health* correlates particularly strong with life satisfaction in older adults and chronically ill individuals (Campbell et al., 1976). Again, it seems plausible to assume that elderly and chronically ill individuals are less satisfied with their health, and, in turn, to conclude that domains with low satisfaction are particularly associated with overall life satisfaction.

From this research, it seems likely that the often cited general negativity bias (Baumeister et al., 2001; Fiske, 1980; Rozin & Royzman, 2001) might also play an important role in the relationship between specific and general satisfaction judgments. Negativity bias describes a general tendency of negative compared to positive events, objects, traits, or information to be more salient and to have a stronger impact on individuals (Fiske, 1980). In their seminal paper, Baumeister et al. (2001) straightforwardly concluded that "bad is stronger than good" (p. 323). Individuals tend to pay less attention to good rather than to bad things, they process negative information more easily, remember it better, and consider it more in judgments and in decision making than positive information (Rozin & Royzman, 2001). Generally, negativity bias has been demonstrated in various research areas ranging from the strength of physiological responses, to memory, and to decision making (Cohen & Herbert, 1996; Coleman, Jussim, & Abraham, 1987; Gottman, 1994; Ito, Larsen, Smith, & Cacioppo, 1998; Kahneman & Tversky, 1979; Robinson-Riegler & Winton, 1996; Sheldon, Ryan, & Reis, 1996).

Whereas Paper 1 and Paper 2 (Chapter 6.1 and Chapter 6.2) report several examples for negativity biases, this chapter here refers merely to two related studies directly supporting the role of negativity in subjective well-being research. Addressing the relation between income and subjective well-being, Kahneman and Deaton (2010) demonstrated that more income did not necessarily increase happiness, but less income was associated with low emotional well-being and low life satisfaction. The authors identified $75,000 as a threshold, beyond which further increases in income did not improve happiness any longer. Thus, changes in the lower level of income had a greater impact on happiness than did changes in the higher level of income - an observation which is in line with the diminishing marginal utility theorem. In a similar vein, Boyce, Wood, Banks, Clark, and Brown (2013) showed that income losses had a larger effect on subjective well-being than did income gains.

Although empirical evidence delivers strong support for negativity bias in various research areas, including life satisfaction judgments, the question of why this effect occurs is trickier. Mostly, negativity bias is explained by *evolutionary* arguments. From an evolutionary perspective, this bias is crucial because normally negative rather than positive events have a stronger impact on survival. Paying particular attention to these negative events is, therefore, adaptive (Baumeister et al., 2001; Rozin & Royzman, 2001). Other explanations emphasize asymmetrical distributions of negative and positive stimuli in the *environment*. For example, differences in the processing of positive and negative stimuli can be explained by the fact that positive information is more similar and less extreme than negative information (Alves, Koch, & Unkelbach, 2017; see also Paper 1, Chapter 6.1 for more details). And again, other very prominent explanations focus more on internal *cognitive processes*, namely on how accessible information influences judgment formation (Schwarz & Strack, 1999). I will address the latter explanation in the following.

2.2.3 Accessibility in Life Satisfaction Judgments

A central principle of social cognition states that it is the most accessible information that enters into different kinds of judgments - including judgments about one's own life. This general principle of accessibility was applied to life satisfaction judgments by Schwarz and Strack (1999). Their judgmental model of subjective well-being proposes that accessible information has a large impact on life satisfaction judgments. According to this model, this is because individuals cut their search process for judgment-relevant information as soon as they assume having a sufficient basis for making the judgment. Thus, individuals do not consider all information, only the information that comes to mind easily.

Accessibility is determined by recency and frequency of the use of information. Recently activated information thereby refers to *temporary* accessibility whereas frequently activated information refers to *chronic* accessibility (Bless & Schwarz, 2010; Schwarz & Strack, 1999). Information that is temporarily accessible comes to mind only because

attention has been drawn to it, for example, by directly asking a question about a specific aspect of one's life, such as health-related information, just before the life satisfaction judgment. However, information that is chronically accessible comes *mostly* to mind, for example, a person suffering from illness may consider this aspect of his or her life under most circumstances.

2.2.3.1 Evidence for the Influence of Temporary Accessibility on Life Satisfaction Judgments

Temporarily accessible information is defined as information that is accessible due to characteristics of the *situation*. Information is accessible because it has been *recently* activated.

Temporary accessibility of information entering life satisfaction judgments has been examined in different ways, for example, by studying the temporal distance of life events (recent vs. distal; Suh, Diener, & Fujita, 1996; comprehensively reported in Paper 2), by varying the introduction of a survey (Smith, Schwarz, Roberts, & Ubel, 2006; reported in Paper 2), or by varying the order in which the items are assessed (Schimmack & Oishi, 2005; Schwarz, Strack, & Mai, 1991; Smith et al., 2006; Strack, Martin, & Schwarz, 1988; reported in Paper 2).

As the latter way is of particular importance because item order effects may appear in every survey with two or more questions, early research on the influence of temporary accessibility on life satisfaction judgments particularly focused on the effect of *preceding questions*. For example, Schwarz et al. (1991) provided evidence for the notion that satisfaction with a specific domain (here satisfaction with marriage) exerts a strong influence on judgments of general life satisfaction when situational aspects render the respective domain highly accessible. The correlation between the specific domain satisfaction and the general satisfaction was stronger when satisfaction with the specific domain was made accessible due to prior assessment relative to when the general question preceded the specific domain question ($r = .67$ vs. $r = .32$, $z = 2.32$, $p < .01$). Asking about marriage made that

particular domain salient and was then consequently used in the overall judgment (see Strack et al., 1988, for related evidence; reported in-depth in Paper 2).

Although the impact of question order is crucial, the magnitude as well as the relevance of question order effects have been challenged (Lucas, Oishi, & Diener, 2016; Schimmack & Oishi, 2005). Schimmack and Oishi (2005), for example, questioned the practical relevance of item-order effects in life satisfaction judgments. According to the authors, only 10% of the variance in life satisfaction can be explained by temporary accessibility induced by item-order effects, whereas 80% of the life satisfaction variance can be attributed to chronically accessible information, such as current concerns or goals of individuals. The remaining 10% of variance are due to random measurement error (see Eid & Diener, 2004, for similar results). Moreover, a meta-analytic review of studies addressing item-order effects of domain satisfactions and life satisfaction revealed that these effects tended to be smaller and less pronounced than the effects found in the early studies by Strack et al. (1988) and Schwarz et al. (1991). However, even if item-order effects were small, they did emerge and, on average, the correlation between specific satisfactions and general satisfaction significantly rose from $r = .32$ to $r = .40$ ($z = 2.85$, $p < .05$) when the item-order was reversed.

Beside questioning their practical relevance, early research on item-order effects has often been criticized for the use of small samples because these samples usually overestimate effect sizes (Lucas et al., 2016). More recent research, however, has shown that general item-order effects also occur in large samples. For example, in a large sample representative of the U.S. population respondents have been either asked political questions before or after life satisfaction has been assessed (Deaton & Stone, 2016). The order of the questions influenced the life satisfaction judgment insofar as life satisfaction was significantly lower when respondents answered political questions first compared to respondents who answered the life satisfaction question first. To this extent, life satisfaction judgments tend to be influenced by

prior questions, even in large and nationally representative data, and item-order effects should, therefore, be considered in survey research.

2.2.3.2 Evidence for the Influence of Chronic Accessibility on Life Satisfaction Judgments

Beside the impact of temporarily accessible information, life satisfaction judgments can also be influenced by *chronically* accessible information. Chronically accessible information is rather independent of the situation and describes information that comes to mind easily when it has been used frequently because it is related to one's own goals, concerns, needs, or values (Oishi et al., 1999; see Paper 2 for details).

One study directly addressing the role of chronic accessibility is provided by Oishi, Schimmack, and Colcombe (2003). In their correlational study, individuals being chronically high in excitement based their life satisfaction judgments more on the frequency of excitement rather than individuals being chronically low in excitement; the study is also reported in Paper 2. Thus, life satisfaction is also based on chronically accessible information.

Whereas temporary accessibility has been extensively studied (see Chapter 2.2.3.1), very little *experimental* evidence is available that directly examines the influence of chronic accessibility on life satisfaction judgment. This is neither surprising nor an indication of a research gap. The term of chronic accessibility is closely related to stable factors influencing life satisfaction (Diener et al., 1999), such as stable personality traits and, therefore, does not allow for any experimental manipulation.

2.2.4 Synthesis: The Role of Negativity and Accessibility in the Domain Satisfaction-Life Satisfaction Relationship

Combining the above considerations on the influence of negativity bias on life satisfaction judgments (Chapter 2.2.2) and on the influence of accessibility on life satisfaction judgments (Chapter 2.2.3) results in the hypothesis that, *first*, negative aspects contribute more than positive aspects to overall evaluations, and *second*, that life satisfaction judgments are strongly influenced by accessible information.

The discussion of the negativity bias and the particular salience of negative information in life satisfaction judgments suggests that individuals will intensely elaborate on negative, rather than on positive, information. Given that accessibility is, among other factors, a function of how often and how much individuals have thought about particular information, domains with low satisfaction should be more accessible and, in turn, more influential for the overall judgment.

To the best of my knowledge, only one study has provided direct evidence for the higher accessibility of negative domain satisfactions in overall judgments. Schul and Schiff (1993) asked for individuals' satisfaction with their telephone provider as well as for their satisfaction with specific aspects of the service provided. Additionally, they systematically manipulated accessibility by varying the question order in which the domain satisfactions and the overall customer satisfaction were assessed (general - specific vs. specific - general). When the general question preceded the specific domain questions, the correlation between overall satisfaction and the four least satisfactory domains was $r = .55$, but only $r = .37$ for the four most satisfactory domains. When the specific questions preceded the general question, the differential impact between the least and the most satisfactory domains was reduced ($r =$ 60. vs. $r = .53$).[2] Generally, the authors argued that negative experiences are often associated with a hindering of goal-directed activities about which individuals tend to ruminate - which in turn increases the accessibility of these experiences. The accessibility differences between the four most versus the four least satisfactory domains were reduced by the fact that participants had to think about all the domains in the specific-general question order.

Going beyond Schul and Schiff (1993) the dissertation places the focus on overall life satisfaction judgments (not customer satisfaction), relies on nationally representative data (not on customer data of a telecom company), and systematically investigates various domain

[2] Please note that the authors state that "while the difference between the two correlations is significant in both conditions ($t = 2.55$ in SG [specific - general] condition, $t = 5.69$ in the GS [general - specific]) it is more than twice as large in the GS condition" (Schul & Schiff, 1993, p. 544).

satisfactions separately (not averaged domains in sets of four). Analyses, moreover, use different conceptualizations of domain negativity in both cross-sectional analyses (within and between participants) and longitudinal analyses, addressing changes in satisfaction (Research Questions 1 and 2, see Chapter 3).

2.3 The Influence of Life Events on Life Satisfaction

Although the role of accessibility in life satisfaction judgments and the process of *how* individuals determine whether or not they are satisfied with their life are indeed crucial, research on life satisfaction has also been interested in *what* makes people satisfied. Since the beginning of life satisfaction research (e.g., Andrews & Withey, 1976; Campbell, 1976), variables that are correlated with individuals' reports of happiness and satisfaction have been identified; for example, personality traits (Costa & McCrae, 1980; DeNeve & Copper, 1998; Diener et al., 2003; Hayes & Joseph, 2003), social relations (Myers, 1999), money (Diener & Biswas-Diener, 2002; Dunn, Aknin, & Norton, 2008), or physical exercise (Penedo & Dahn, 2005); see Diener et al. (1999); Diener et al. (2003); Ryan and Deci (2001), for general overviews.

After finding what makes people satisfied with their life, research highlighted the question of how to *stay* satisfied (see Armenta, Bao, Lyubomirsky, & Sheldon, 2014; Sheldon & Lucas, 2014, for overviews). Research drew attention to *critical life events* (see Paper 3 for more details on factors influencing stability and change in life satisfaction) and their potential influence on changes in the reports of individuals' life satisfaction (see Lucas, 2007a, for an overview).

In this respect, the role of life events has been discussed controversially. Critical life events can have an impact on life satisfaction and may cause fluctuations. However, these changes in life satisfaction are often said to be only temporary, and that sooner or later, individuals *get used* to it and consequently return to their baseline level of satisfaction (Brickman & Campbell, 1971; Headey & Wearing, 1989). Early and influential studies

supported the idea of the so-called *hedonic adaptation* to both positive and negative events over time. For example, individuals who experienced critical life events, such as winning the lottery or becoming disabled, did not differ as much as expected in their satisfaction levels one year after the event (Brickman, Coates, & Janoff-Bulman, 1978).

Moving research on hedonic adaptation forward, recent studies examined a broad range of life events which are associated with life satisfaction - ranging from family-related events, such as marriage (Clark & Georgellis, 2013; Lucas, Clark, Georgellis, & Diener, 2003), transition into parenthood (Clark et al., 2008), divorce (Clark et al., 2008; Lucas, 2005), and widowhood (Lucas et al., 2003), to work-related events, such as unemployment (Clark & Georgellis, 2013; Lucas, Clark, Georgellis, & Diener, 2004), reemployment (Clark, Georgellis, & Sanfey, 2001), or job change (Boswell, Boudreau, & Tichy, 2005), and health-related events, such as the onset of illness (Lucas, 2007b) or cosmetic surgery (Margraf, Meyer, & Lavallee, 2013; Wengle, 1986).

Among the list of various life events, *transition into parenthood* is a particularly interesting life event to study. First of all, the transition into parenthood implies more than just the event itself. The birth of the first child, of course, changes the life of parents for a considerably long time, but more importantly, the transition into parenthood also has undeniable effects before the actual birth, including, in some cases, the decision to get pregnant. This allows not only for the investigation of *adaptation*, but also of *anticipation*. Moreover, the birth of the first child does not only influence the overall evaluation of life, but effects are likely to *spillover* to other life domains, such as health, family, or income. These spillover effects[3] to specific life domains may turn out quite differently, that is, childbirth may

[3] The term *spillover* has been commonly used in the literature (see e.g., Bernardi, Bollmann, Potarca, & Rossier, 2017) and refers to effects that are not closely related to overall life satisfaction and family life satisfaction. Effects, for example, might spillover to the sleep or income satisfaction domain. The issue when and why a certain domain is considered as a "closely related domain" or as a "spillover domain" has not been discussed so far, to the best of my knowledge, and is best distinguished by intuitive reasoning and common sense.

affect certain domains positively whereas other domains are simultaneously affected negatively or not at all. Thus, positive, negative, and no effects can be expected, which render a differentiated view of facets of satisfaction judgments necessary. And last, but not least, from a political point of view childbirth is an interesting event to study because birth rates in most industrialized countries significantly decreased over the past few decades and remained stable at low levels (Statistisches Bundesamt, 2016). One reason for low birth rates, especially in Germany, is the difficult reconciliation of career and parenthood for women (Statistisches Bundesamt, 2009). Therefore, changes in life satisfaction in women compared to men, as well as in women with different employment status, are particularly interesting to study, even beyond the scope of psychological research. In this respect, Paper 3 examines the effect of transition into parenthood on life satisfaction, including anticipation and adaptation, possible *spillover effects* to other satisfaction domains, and possible *differential effects* in subgroups.

2.3.1 The Effect of Transition into Parenthood on Life Satisfaction

The birth of the first child affects parents' subjective well-being in diverse ways - both positively and negatively, and has often been best described by a reversed u-shaped course over time. A reversed u-shape implies that childbirth has initial positive effects around the time of the birth followed by decreases after birth back to pre-birth baseline levels (e.g., Clark et al., 2008; Frijters et al., 2011) or even below the pre-birth level (e.g., Luhmann et al., 2012). On average, the reversed u-shaped course of life satisfaction occurs over time, but it can also be modified. For example, individuals' pre-birth satisfaction level impacts how life satisfaction changes before and after the transition into parenthood. Individuals with higher pre-birth satisfaction levels experienced smaller increases in life satisfaction and stronger decreases after transition into parenthood, compared to parents with lower pre-birth levels of life satisfaction (Dyrdal & Lucas, 2013). Moreover, the effect of childbirth can also differ depending on parents' age at the time of transition into parenthood. Myrskyla and Margolis (2014), for example, showed that those who had children at an older age reacted particularly

positively to the transition into parenthood compared to those who had children at younger age. Similarly, education influenced the reaction to childbirth, whereby educated parents reacted more positively than uneducated (Myrskyla & Margolis, 2014). In short, this research indicates that satisfaction patterns following and preceding childbirth can be modified by demographic factors. In this respect, the dissertation addresses two particularly important indicators: gender and employment status.

2.3.2 Differential Effects of Childbirth in Subgroups

The effect of the transition into parenthood on satisfaction judgments is likely to differ between men and women, whereby women compared to men generally seem to react more strongly to the event of childbirth (e.g., Clark & Georgellis, 2013; Dyrdal & Lucas, 2013). For example, women reported higher levels of life satisfaction before transition into parenthood, however, rapidly returned to their baseline level after birth, whereas men did not experience such strong changes in life satisfaction either before or after birth (Clark & Georgellis, 2013). Clark et al. (2008) demonstrated that both men and women showed comparable patterns of anticipation and adaptation, but women, in general, experienced a greater increase in life satisfaction. Similarly, Dyrdal and Lucas (2013) found comparable reactions of both men and women to the birth of the first child, with an initial anticipation boost and subsequent adaptation within two years.

This effect is not surprising, especially when considering a sample which is representative for the German population (e.g., the Socio-Economic Panel, the data I used). First, generally women, on average, experience more changes in different areas of their life than do men. For example, normative role change is usually considered to be stronger for women compared to men because especially during the time of *early care*, roles of mothers and fathers are very different (e.g., Laflamme, Pomerleau, & Malcuit, 2002; Milkie, Bianchi, Mattingly, & Robinson, 2002). Second, specifically considering women in countries with

limited childcare possibilities, such as Germany, mostly women, not men, have to reduce their working time at least temporarily (European Commission, 2009).

In this respect, employment status is likely to modify the influence of childbirth on life satisfaction and domain satisfactions, especially for women. Women's employment rate strongly decreases after childbirth in Germany (from 83% to 63%; Statistisches Bundesamt, 2009). So far, research mostly a priori restricted its analyses to reduced samples of full-time and part-time employed participants only (e.g., Bernardi, Bollmann, Potarca, & Rossier, 2017), and ignored that the effect of childbirth may differ, depending on whether women are employed or not.

2.3.3 Differential Effects of Childbirth on Satisfaction Judgments

Not only overall life satisfaction seems to be influenced by childbirth, but also specific domain satisfactions, such as relationship satisfaction or job satisfaction, can be influenced by childbirth. Systematic investigations are still missing, and this is Paper 3's starting point.

Some domains which are closely-related to the transition into parenthood, such as marital or job satisfaction, however, have already been examined. In this respect, marital satisfaction declined after childbirth (Lawrence, Cobb, Rothman, Rothman, & Bradbury, 2008) and remained permanently lower than before childbirth (Luhmann et al., 2012). In addition to the family domain, the work domain is also negatively influenced by childbirth. For example, Georgellis, Lange, and Tabvuma (2012) demonstrated that childbirth has long-lasting negative effects on job satisfaction. In sum, childbirth does not only influence overall life satisfaction, but also may spillover to different domain satisfactions which I will systematically investigate.

Based on the above review of the existing research on the relation between childbirth and judgments of life satisfaction, Paper 3 examined how the birth of the first child influences different domain satisfactions and life satisfaction in general, thereby also investigating differential effects in subgroups (see Research Question 3).

3 Research Questions

The dissertation investigates how judgments of overall life satisfaction are influenced by domain negativity and critical life events. Three main research questions are outlined as follows. For a more detailed deduction and description of the research questions, see full-length papers (Chapter 6.1 to Chapter 6.3).

Research Question 1 addresses *whether* domain negativity influences life satisfaction judgments. Based on theorizing on negativity bias (Baumeister et al., 2001; Rozin & Royzman, 2001; see Chapter 2.2.2), I state that the contribution of domain satisfactions to general life satisfaction varies as a function of negativity. More specifically, domains with which individuals are least satisfied have a particularly strong influence on overall life satisfaction. The first research question, including three different approaches to conceptualize domain negativity, reads as follows:

1. *Does domain negativity influence the relationship between domain satisfactions and overall life satisfaction?* Three sub-questions look at aspects of domain negativity from different angles.
    a. *Does the least satisfying domain influence life satisfaction more strongly than the most satisfying domain (domain negativity within participants)?* I expect that - independent of which domain is the lowest or the highest within each individual - it is, in fact, the lowest domain satisfaction which exerts a stronger unique influence on general life satisfaction in comparison to the domain with which individuals are most satisfied.
    b. *Does a specific domain satisfaction correlate more strongly with life satisfaction in individuals who are least rather than most satisfied with the respective domain (domain negativity between participants)?* If domain negativity holds, stronger associations between a specific domain satisfaction and life satisfaction should occur for individuals who rated that respective

domain as most dissatisfying compared to individuals who rated the respective domain as most satisfying.

c. *Do negative changes in domain satisfactions influence life satisfaction more strongly compared to positive changes in the respective domain satisfaction (longitudinal design)?* Considering the change aspect over time in domain satisfactions, I expect that decreases in a specific domain satisfaction exert a particularly strong influence on judgments of overall life satisfaction compared to increases in a specific domain satisfaction.

Research Question 2 addresses *why* negative domains exert a particular influence on life satisfaction judgments. More specifically, based on theorizing on judgmental models of subjective well-being (Schwarz & Strack, 1999; see Chapter 2.2.3), I investigate whether a pronounced *accessibility* of negative domains can explain their disproportional representation in the overall life satisfaction judgment. The second research question reads as follows:

2. *How does domain negativity influence the relationship between domain satisfactions and life satisfaction?* Taking health satisfaction as an example, two sub-questions address whether the relationship between health satisfaction and life satisfaction differs in healthy versus unhealthy individuals, and whether a possible difference can be reduced by increasing temporary accessibility of health-related information.

   a. *Is health satisfaction more strongly associated with life satisfaction in unhealthy compared to healthy individuals?* The domain negativity effect, comparable to Research Question 1, should be reflected in a stronger relationship between health satisfaction and life satisfaction in individuals rating their health as poor compared to individuals rating their health as good.

   b. *Does rendering health-related information temporarily accessible reduce the difference in the relationship between health satisfaction and life satisfaction*

in healthy versus unhealthy individuals? The domain negativity effect should be more pronounced when life satisfaction is assessed prior to the health satisfaction item. When a prior question about health renders health-related information accessible, no differential accessibility of health satisfaction is expected in healthy and unhealthy individuals. Accordingly, the difference in the relation between health satisfaction and life satisfaction in healthy versus unhealthy individuals, should, therefore, be reduced.

Research Question 3 addresses the role of life events, specifically the transition into parenthood. In contrast to previous research and simultaneously in line with the dissertation's strong focus on general satisfaction *and* specific satisfactions, I examine the influence of childbirth on life satisfaction and *spillover effects* in different *subgroups* (see Chapter 2.3). The research question reads as follows:

3. Does *the transition into parenthood influence life satisfaction and do spillover effects to other domain satisfactions (e.g., job, health, income, leisure, among others) occur?* Building on research that has primarily focused on the effect of childbirth on *one* facet of subjective well-being (mostly life satisfaction), Research Question 3 specifically expects spillover effects to different domain satisfactions. Whereas for life satisfaction, I expect a reversed u-shaped pattern including anticipation and adaptation, parts of this research question addressing the spillover effects on different domain satisfactions are of an explorative nature. Moreover, two sub-questions address the modifying role of gender and employment status on the effect of childbirth on life satisfaction and domain satisfactions.

a. Does gender modify the influence of childbirth on domain satisfactions and life satisfaction? Effects of childbirth on domain satisfactions and life satisfaction are likely to differ between men and women due to different normative roles, early caregiving responsibilities, and pronounced individualistic self-

realization values in most Western countries (see Chapter 2.3.2). As women are primarily affected by raising children, I expect stronger deviations from pre-birth satisfaction levels in women rather than in men.

b. *Does employment status influence the effect of childbirth on women's domain satisfactions and life satisfaction?* Women, and not men, are struggling mainly to reconcile career and family, which holds especially true in Germany (see Chapter 2.3.2). Therefore, women's employment status should influence the effect of childbirth on domain satisfactions and life satisfaction. This part of Research Question 3 is of an explorative nature.

4 Summary of Articles

This section provides brief summaries of the three papers on which this dissertation is based. The full-length papers are provided in Chapter 6.1 to Chapter 6.3.

4.1 Paper #1: The More Negative the More Impact

Paper 1 entitled "The more negative the more impact: Evidence from nationally representative data on the relation between domain satisfactions and general life satisfaction" investigates the relation between different domain satisfactions (e.g., satisfaction with health, income, family life) and overall life satisfaction. Based on theorizing on the differences between positive and negative information, we assumed that the relationship between specific domain satisfactions and overall life satisfaction is a function of domain negativity. Domain negativity was examined in a total of three studies: a *within*-participant approach and a *between*-participant approach, as well as a *longitudinal* approach.

In the within-participant analysis, we ranked all domain satisfactions within each individual from lowest to highest and examined whether the lowest domain satisfaction exerts a stronger unique influence on life satisfaction compared to the highest domain satisfaction. In the between-participant analysis, we systematically analyzed each domain satisfaction

separately and examined whether a specific domain satisfaction correlates more strongly with life satisfaction in the subgroup of individuals who were least satisfied with the respective domain compared to the subgroup of individuals who were most satisfied with the respective domain. We extended and strengthened the results of these two cross-sectional approaches by testing the effect of year-to-year changes (increases vs. decreases over time) in domain satisfactions on overall life satisfaction in a longitudinal analysis. All three studies were based on nationally representative data (Socio-Economic Panel; Wagner, Frick, & Schupp, 2007). For the cross-sectional approaches, we used data from the most recent wave at the time of analyses (2013) and for the longitudinal approach we analyzed changes in domain satisfactions over 22 years (1992 to 2013). We conducted a multiple regression analysis in the within-participant approach, compared correlations in the between-participant approach, and analyzed longitudinal data with fixed-effect regressions.

The findings of all three studies strongly supported that the more negative the domain satisfaction the more pronounced was the relation between it and overall life satisfaction. Emphasizing the stability of the findings, the general pattern remained stable when the results were controlled for common demographic and socio-economic variables (see Chapter 6.1.2.1), when data were analyzed in independent subgroups (see Chapter 6.1.2.2), and when we cross-validated the results with data from another survey wave (see Chapter 6.1.2.3).

Generally, the results demonstrate a pronounced impact of domain negativity in life satisfaction judgments. The observation that domains with less satisfaction are more strongly related to overall life satisfaction compared to domains which go along with higher satisfaction also fits well with general models on the particular role of negative information. As demonstrated in different research areas, positive and negative information can differ on various dimensions (e.g., diagnosticity, adaptiveness, extremeness, accessibility) leading to an increased impact of negative information on integrative judgments (see Alves et al., 2017; Baumeister et al., 2001; Fiske, 1980; Rozin & Royzman, 2001, for overviews). In this respect,

Paper 1 directly contributes to research on these valence asymmetries by demonstrating an increased impact of domain negativity on an integrative life satisfaction judgment. Details of our theoretical and methodological considerations, results, and an elaborated discussion of this multi-study paper are reported in the published long-version of this research (Chapter 6.1).

Engel, J. & Bless, H. (2017). The more negative the more impact: Evidence from nationally representative data on the relation between domain satisfactions and general life satisfaction. *Social Psychology*, *48*, 148–159. doi: 10.1027/1864-9335/a000305. Current Impact Factor: 2.602.

4.2 Paper #2: Judgmental Processes Underlying Reports of Life Satisfaction

Paper 2 entitled "Experimental evidence on the relation between specific domain satisfactions and overall life satisfaction: Why negative domains exert a particular influence" focuses on the underlying mechanism of the stronger impact of negative domains in life satisfaction judgments. Building on the results of the domain negativity effect of Paper 1, Paper 2 examines the *process* underlying the pronounced impact of negative domains in overall life satisfaction judgments. Based on the judgmental model of subjective well-being (Schwarz & Strack, 1999), life satisfaction judgments primarily reflect information that comes to mind easily at the time the judgment is made, or to put it differently information that is accessible. Paper 2, therefore, investigates the role of accessibility of negative domains in the domain satisfaction-life satisfaction relationship. Using a self-generated online-survey, I compared correlations between health satisfaction and life satisfaction. Specifically, I distinguished between healthy and unhealthy individuals and manipulated the temporary accessibility of health satisfaction by varying the question order in which the two satisfaction items (general and health) were assessed.

Results supported accessibility as an underlying mechanism. The correlation between health satisfaction and life satisfaction was more pronounced for individuals with poor health

compared to individuals with good health. The effect, however, only occurred when health-related information was not made accessible by a prior question. When health information was made accessible by a preceding question, individuals' health satisfaction and life satisfaction were about equally correlated in healthy and unhealthy individuals. Paper 2 also includes a validation of the results in nationally representative data (Socio-Economic Panel; Wagner et al., 2007), a description of the full design of this study including an additional health priming condition, as well as a post-hoc study which qualitatively examined the health primes.

Generally, Paper 2 contributes to research on judgmental processes underlying reports of life satisfaction by showing that an increased accessibility of domain-specific information reduces the domain negativity effect. More detailed and further information on theoretical and methodological considerations, results, and a general discussion can be found in Chapter 6.2.

Engel, J. (2017). Experimental evidence on the relation between specific domain satisfactions and overall life satisfaction: Why negative domains exert a particular influence.

4.3 Paper #3: Lag and Lead Effects of Childbirth on Satisfaction Judgments

As seen before, life satisfaction judgments are influenced by accessible information, for example, by information that is related to negative domains (Paper 1) and by information that has been recently activated by a prior question in a survey (Paper 2), but, of course, life satisfaction judgments can also be strongly impacted by critical life events. Taking childbirth as an example of such an important life event, Paper 3 entitled "Lag and lead effects of critical life events - Now you see them, now you don't: Effects of childbirth on life satisfaction and domain satisfactions" investigates parents' life satisfaction and different domain satisfactions before and after the transition into parenthood. Building on classical adaptation theories predicting both anticipation and adaptation to life events (reversed u-shaped course), Paper 3 specifically examines spillover effects of life events on various

domain satisfactions as well as differential effects in specific subgroups (gender, employment status). As in Paper 1, the analyses were based on large-scale longitudinal data (Socio-Economic Panel; waves 1992 to 2013; Wagner et al., 2007). Using lag and lead regression models, we found evidence for dynamic effects of childbirth on life satisfaction and domain satisfactions.

Results demonstrated that satisfaction with life in general and, less pronounced, satisfaction with family life showed a reversed u-shaped course, indicating both anticipation and adaptation to childbirth. However, analyzing satisfaction with other specific domains, we observed after childbirth decreases in domain satisfactions (leisure, sleep, household income), some increases in other domain satisfactions (dwelling, job), and relatively stable satisfaction levels (income, household role). Moreover, gender modified parental satisfaction before and after childbirth in the way that women generally reacted more strongly to childbirth than did men. Additionally, reactions to childbirth were differentially related to employment status of women. Employed women were only slightly affected by childbirth and none of the considered employment status groups showed clear anticipation and adaptation to the birth of the first child.

Taken together, the findings suggest that childbirth has quite *dynamic* effects on life satisfaction and different domain satisfactions. In this respect, Paper 3 contributes to research on hedonic adaptation by showing that traditional reversed u-shaped courses in life satisfaction, including anticipation and adaptation only occur *on average*. However, a closer look at different facets of satisfaction and different subgroups points to the complexity of the effects of the transition into parenthood and even indicates that the reversed u-shaped course might be a mere aggregate effect. For more information about theoretical and methodological considerations, results, and discussion, see Chapter 6.3.

Engel, J. & Bless, H. (2017). Lag and lead effects of critical life events - Now you see them, now you don't: Effects of childbirth on life satisfaction and domain satisfactions (submitted).

5 General Discussion

The dissertation addresses the role of domain negativity and life events in life satisfaction judgments. Results of, in total, two papers support the hypotheses that life satisfaction judgments are strongly influenced by domains with which individuals are unsatisfied and that this pronounced impact is due to an increased accessibility of these negative domains (Paper 1 and Paper 2, see Chapter 6.1 and Chapter 6.2). Moreover, the results show that life satisfaction is influenced by life events, which impact facets of satisfaction as well as subgroups *differently* (Paper 3, see Chapter 6.3).

5.1 The Influence of Domain Negativity on Life Satisfaction Judgments

Paper 1 and Paper 2 examine the influence of domain negativity in the domain satisfaction-life satisfaction relationship. Specifically, the research addresses both the *effect* as well as the underlying *mechanism* in large *N*, nationally representative and experimental data.

The obtained findings support Research Question 1, which holds that the relationship between specific domains and overall life satisfaction differs systematically as a function of domain negativity. Results demonstrated that, *first*, the lowest domain satisfaction within each individual influenced life satisfaction more strongly compared to the highest domain satisfaction. *Second*, correlations were reliably higher when a specific domain was considered as least satisfying relative to when the respective domain was considered as most satisfying. *Third*, when individuals experienced a decrease in satisfaction with a specific domain, this domain influenced life satisfaction more strongly than when an increase in the respective domain satisfaction was perceived.

Moreover, the findings also support Research Question 2 which holds that accessibility is a driver of the pronounced impact of negative domains on life satisfaction judgments. Individuals' satisfaction with their health correlated substantially higher with their overall life satisfaction when participants reported a poor health status compared to when participants reported a good health status. This difference between healthy and unhealthy individuals disappeared when health-related information was rendered accessible. Health aspects, due to the recent activation, were equally accessible for all participants independent of their health status.

5.1.1 Theoretical Implications

Paper 1 and Paper 2 contribute to the literature on subjective well-being in various ways. Overall, the reported research provides the first systematic investigation that addresses the role of *negativity* and *accessibility* in the relationship between several domain satisfactions and life satisfaction.

The findings of Paper 1 and Paper 2 contribute further empirical evidence to the negativity bias, which has been demonstrated in diverse areas (Ito et al., 1998; Kahneman & Tversky, 1979; Pratto & John, 1991; see Baumeister et al., 2001; Rozin & Royzman, 2001, for overviews). Three innovative studies in Paper 1 and one conceptual replication in Paper 2 prove the role of domain negativity in life satisfaction judgments. The particular influence of low satisfaction domains converges with prior research, for example, on the relation between income with general life satisfaction (e.g., Diener & Diener, 1995; Kahneman & Deaton, 2010) and health with general life satisfaction, respectively (e.g., Campbell et al., 1976). The present research suggests that such effects are not restricted to income or health, but reflect a more general and universal pattern according to which domains with which individuals are not satisfied bear a stronger influence on general life satisfaction than those domains with which individuals are satisfied.

Going beyond the mere evidence of the domain negativity effect, the dissertation also contributes to the literature on *how* life satisfaction judgments are formed. Results of Paper 2 are in line with the judgmental model offered by Schwarz and Strack (1999), who argued that judgments of life satisfaction are influenced by either temporary or chronic (or both) accessibility of judgment-relevant information (see Oishi et al., 1999, for further empirical evidence). Moreover, the findings fit nicely with the conclusion offered by Schul and Schiff (1993). who showed that due to high accessibility, negative aspects contribute more than positive aspects to overall evaluations. Although several explanations for the negativity bias have been offered that focus on various memory and judgmental processes, the present research particularly emphasizes the notion that the negativity bias may, at least in part, result from the increased accessibility of negative information.

5.1.2 Criticism and Anticriticism

Although overall, the obtained findings of Paper 1 and Paper 2 are in line with research on the particular role of negative information and accessibility, the following aspects address possible criticisms to a) the idea of domain negativity, b) the reproach of a methodological artifact producing the results, and alternative explanations for c) the negativity effect and for d) its underlying mechanism. I also discuss the following points in Paper 1.

a) Are negative domain satisfactions really negative? Yes. Mostly individuals are satisfied with their life (Diener & Diener, 1996). Do negative domain satisfactions, therefore, really qualify as *negative* or are they just *not as positive* as the rest? In my research, most of the minimum domain satisfactions were not only *relatively* negative but also *absolutely* negative, when the scale midpoint is considered as a relevant threshold. Moreover, one may argue that evaluations are most often of a relative nature and that evaluations crucially depend on which comparison standard is employed (Bless & Schwarz, 2010). Whereas some of the alternative explanatory constructs for negativity bias (see d) below) focus on *absolute*

negativity (e.g., adaptiveness, Baumeister et al., 2001), other constructs (e.g., diagnosticity, informativeness, accessibility; Alves et al., 2017) do not make such requirements, but argue *relative* to the set of available information.

b) Is the domain negativity effect merely a methodological artifact? No. Skewed distributions were obtained for positive versus negative domains that resulted in higher variances in the groups, representing participants who were least, compared to most, satisfied with a respective domain (ceiling effects in positive domain satisfactions). One might argue that this pattern, in turn, accounts for the observed differential correlations. Note that unequal distributions of positive and negative information are very much in line with the assumptions underlying many negativity effects (Alves et al., 2017) and might, in fact, be part of the actual phenomenon. Nevertheless, in various ways I tried to reduce the potential impact of this caveat in my analyses. Specifically, the reported analyses that are based on the rank order in part circumvented this problem and still resulted in the same conclusions.

c) Is domain importance, rather than domain negativity, a better explanation? No. Another potential alternative explanation for the differential correlations between domain satisfactions and life satisfaction could hold that some domains are important (e.g., income) but hard to satisfy, whereas other less important domains (e.g., dwelling) can be satisfied more easily. If so, negative domains would have a more pronounced impact than positive domains, as observed, but this pattern would be due to *domain importance* rather than to domain negativity. Several observations render this alternative unlikely. In the longitudinal approach of Paper 1, negativity was inferred from positive versus negative changes of the same domain relative to the previous year, but not relative to other domains. This identification of negative versus positive domains is logically independent of the relative importance of domains to each other (see Paper 1, for a more detailed discussion and further empirical considerations).

d) Is accessibility the only mechanism explaining domain negativity? No. As discussed in Paper 1 and Paper 2, the pronounced impact of negative domains on life satisfaction cannot only be explained by higher accessibility of negative information. Higher extremity or a more pronounced diagnosticity of negative information (see Alves et al., 2017) may also lead to an increased impact of negative information on life satisfaction.

Even if the present research and previous studies (Schul & Schiff, 1993; Schwarz et al., 1991; Strack et al., 1988) confirm accessibility as an underlying mechanism of the pronounced impact of negative domain satisfactions on life satisfaction judgments, it does not necessarily rule out other possible underlying mechanisms. Other theoretical accounts attribute the increased impact of negative information to *unequal distributions* of positive and negative information *in the environment* (Alves et al., 2017; Peeters & Czapinski, 1990; Skowronski & Carlston, 1989).

For example, considering the extremity of positive and negative information, it is the positive information that is less extremely distributed than the negative information (Alves et al., 2017). The present data were presumably not driven by the extremity of the negative information. In fact, the ratings for the domains individuals were least satisfied with were not more extreme than the ratings for the positive domains. On the contrary, means for the positively rated domains were closer to the endpoint of the scale than means for the negatively rated domains (see Paper 1).

Considering the *diagnosticity* of positive and negative information, it is the positive information that is usually more alike as it is more densely located than the negative information (Alves, Koch, & Unkelbach, 2016). If positive information is more densely represented leading to higher redundancy and overlap of those information, any additional piece of positive information should exert less influence on integrative judgments than any additional piece of negative information (Alves et al., 2017). Negative information, therefore, is more diagnostic. In my research, no closing decision can be given regarding whether

diagnosticity of negativity might also explain the domain negativity effect in life satisfaction judgments.

5.1.3 Final Considerations

The following paragraphs zoom out and take over a broader perspective of the general contribution of Paper 1 and Paper 2. I, thereby, refer to general discussions about a) the stability of the domain satisfaction-life satisfaction relationship, on b) the causal direction between domain satisfactions and life satisfaction, as well as on c) the assumed adaptiveness of negativity.

a) The stability of the domain satisfaction-life satisfaction relationship. On a more general level, Paper 1 and Paper 2 contribute to the discussion of the stability of the domain satisfaction-life satisfaction relationship (Diener et al., 1999; Schimmack & Oishi, 2005; Schwarz & Strack, 1999). The results propose that the relation between specific domain satisfactions and overall life satisfaction is unlikely to be stable either between or within individuals. The domain-focused approach of Paper 1 indicated that domains are more strongly related to overall life satisfaction for some individuals than for others - and that the level of the specific domain satisfaction, thereby, plays a crucial role. Moreover, the longitudinal analyses of Paper 1 suggested that the relative contribution of a particular domain satisfaction may vary over time - and that, again, the direction of change in a certain domain satisfaction may play a crucial role. In short, the influence of domain satisfactions on life satisfaction depends on negativity, and is unlikely to be stable either between or within individuals.

b) Causal direction between domain satisfactions and overall life satisfaction. Although Paper 1 and Paper 2 were not designed to test the causal direction between domain satisfactions and overall life satisfaction (bottom-up vs. top-down approaches; Headey et al., 1991), the present results seem rather in line with the assumption that domain satisfactions influence life satisfaction, as proposed in bottom-up theories, rather than the other way

around. According to a simple top-down approach, life satisfaction would influence domain satisfactions equally. This is not in line with the present results supporting differential associations between domain satisfactions and life satisfaction. Given the present findings, a more sophisticated top-down perspective would need to predict that domains are differentially influenced by general life satisfaction, depending on the domain satisfaction level; meaning that the influence of life satisfaction has to be high for domains with low levels of satisfaction and low for domains with high levels of satisfaction. In line with the scientific criteria of parsimony, bottom-up theories would more straightforwardly predict that domain satisfactions influence life satisfaction differently, depending on their negativity.

c) Adaptiveness of negativity. As the results clearly indicate a stronger influence of negative domain satisfactions on life satisfaction, one might speculate about the *function* of this negativity bias. Explanations for the negativity bias mostly rely on evolutionary accounts (Baumeister et al., 2001, e.g., "It's evolutionarily adaptive for bad to be stronger than good", p. 325). The negativity bias serves well when individuals need to be quickly aware of potential dangers which is evolutionarily adaptive.

But is the negativity bias adaptive for happiness and satisfaction? Intuitively, a strong focus on the bright side of life should be more adaptive in the area of happiness and satisfaction in the long run. Considering the manifold positive outcomes of high life satisfaction, such as longevity, health, creativity, and productivity at work (Lyubomirsky et al., 2005), a stronger focus on the positive aspects in life, which are very likely to increase overall life satisfaction, should be more adaptive. In this respect, related research has already demonstrated that biased views toward the *positive* also come along with several advantages. For example, positive illusions, that are positive thoughts about oneself and others in terms of self-aggrandizing self-perceptions, unrealistic optimism about the future, and illusion of control may promote mental health and well-being, even if those thoughts are unrealistic (Taylor & Brown, 1988; Taylor & Brown, 1994).

Presumably, both negativity bias and positivity bias can occur in the area of happiness and satisfaction. Logically, one question subsequently arises: When does negativity bias and when does positivity bias occur? The answer: It depends on the *individual* and on the *domains* which are being considered. For example, Diener, Lucas, Oishi, and Suh (2002) found that *happy individuals* weigh positive domains more heavily than do unhappy individuals. Heavily weighting positive aspects for life satisfaction judgments is, thus, associated with higher overall happiness. Given a general negativity bias as demonstrated in the present work, a pronounced weighting of positive information could, therefore, constitute a fruitful strategy to actively and intentionally increase overall satisfaction.

Moreover, the direction of the valence bias depends on the specific *domain* being considered. For example, Skowronski and Carlston (1987) suggested that negativity effects in impression formation occur when the integrated information refers to the domain of morality, whereas positivity effects occur when the information refers to the domain of competence. Interestingly, in the present work the only positivity effect emerged for changes in job satisfaction (see Paper 1), a domain which is closely related to the above-mentioned competence domain.

To sum up, no final answer can be given to whether a positivity bias or a negativity bias is more adaptive in the area of happiness and satisfaction. As stated above, it may depend on the individual and the specific domain.

5.1.4 What Can We Learn? Some Practical Considerations

In a way, the data of Paper 1 and Paper 2 offer a somewhat unfortunate perspective. Whereas evolutionarily, the focus on negative aspects may constitute an important and crucial element, at the same time, this presumably often necessary focus on the negative may reduce individuals' overall life satisfaction. Given this constellation, one may speculate about how individuals may increase their satisfaction with life. A first option is to improve the satisfaction with specific domains by focusing on those domains with which individuals are

least satisfied. Increasing satisfaction with these domains will contribute most to improve life satisfaction overall. This may hold for personal attempts (e.g., engaging in physical activities to improve health) as well as for initiatives on a societal or political level (e.g., improving the health care system). In addition to advancing the objective conditions, which is difficult or even impossible for some domains under some circumstances, Paper 2 offers a quite practical and feasible solution. Individuals should actively increase the accessibility of domains with which they are satisfied with in order to increase their influence on the overall life satisfaction judgment - which is very much in line with the advice that self-help books offer in different and numerous variants.

5.2 The Influence of Life Events on Satisfaction Judgments

Paper 3 examines parental trajectories in overall life satisfaction and spillover effects to specific domain satisfactions before and after the birth of the first child. Overall life satisfaction showed a reversed u-shaped pattern, with increases in the year before and in the year of birth itself, and subsequent decreases back to pre-birth baseline levels in the years after the transition into parenthood (consistent with e.g., Clark et al., 2008; Clark & Georgellis, 2013; Frijters et al., 2011; Myrskyla & Margolis, 2014). This reversed u-shaped course of overall life satisfaction was observable for both men and women, but was more pronounced for women supporting previous research on gender differences in reaction to life events (e.g., Bernardi et al., 2017; Clark & Georgellis, 2013; Dyrdal & Lucas, 2013) - although traditional gender roles of parental caregiving and breadwinning identity seem to have attenuated to some degree (Statistisches Bundesamt, 2016).

Whereas, in general, the obtained patterns reflected the typical reversed u-shaped function, a closer look revealed that it did not hold for all specific satisfaction domains and all subgroups. When looking at *different domain satisfactions* in the overall sample, only health satisfaction and family life satisfaction showed the typical reversed u-shaped patterns, other

domains permanently decreased (household income, and in particular leisure and sleep) or increased (job, dwelling) after childbirth.

The reversed u-shaped course was also questioned when looking at different domain satisfactions in *certain subgroups*. For *women*, the reversed u-shaped function was restricted to the domains of health and job. For *men*, it was observable for the family life domain. All other domains showed different patterns. For some domains, relatively stable decreases (both for men and women in leisure, sleep; for men in household income) and increases (both for men and women in job) in satisfaction emerged after childbirth. Various domain satisfactions showed an increase in the year before the event, most likely reflecting positive developments in, for example, relationship quality before childbirth (family life and dwelling). A very recent study explicitly tested for spillover effects of three domain satisfactions in men and women (Bernardi et al., 2017). The work by Bernardi et al. (2017) is conceptually very similar to my own research, used the same data set, and has been published during my research process. Comparable to my results, the authors found stronger reactions to childbirth in women as well as substantial decreases in women's leisure satisfaction.

In addition to looking at the male versus female subgroups, Paper 3 identified that the course of satisfaction judgments for women varied as a function of their *employment status*. Neither employed women, unemployed women, nor women with a changing employment status, showed the reversed u-shaped pattern anymore. Interestingly, employed women were less affected by childbirth in both overall satisfaction as well as in specific domain satisfactions, and thus, had similar satisfaction courses as men. This points to the possibility that the differential patterns observed for women versus men could be mainly driven by employment status.

Taken together, the present findings suggest that childbirth has quite *dynamic* effects and significantly influences judgments of overall life satisfaction as well as satisfaction with specific domains. Although in part supporting prior research (Clark et al., 2008; Luhmann et

al., 2012), Paper 3 makes typical anticipation-adaptation patterns in satisfaction judgments appear more fragile than perhaps often assumed.

5.2.1 Theoretical Implications

Parents' life satisfaction before and after childbirth has often been described with a reversed u-shaped curve, with increasing levels of satisfaction in the years before birth and relatively fast adaptation back to pre-birth baseline levels in the years after childbirth (e.g., Clark et al., 2008), and has been treated as support for a set point assumption and similar theoretical approaches on hedonic adaptation (Diener et al., 2006; Headey & Wearing, 1989; Lykken & Tellegen, 1996). A closer look at different domain satisfactions and different subgroups as taken in Paper 3, revealed that not all courses in life satisfaction and domain satisfactions followed the typical anticipation-adaptation pattern.

The results may point to the possibility of an aggregate effect. In such a case, one would obtain the typical reversed u-shaped pattern, but only because combining different subgroups with quite different courses *add up* to such an overall aggregate pattern. For example, one subgroup would show strong anticipation effects and remain at high satisfaction levels afterwards, whereas another subgroup would show no anticipation to childbirth and would strongly decline in its satisfaction level afterwards. This has implications because even if in the overall sample and in the overall judgment the reversed u-shaped pattern emerges, no single individual may show this specific pattern.

5.2.2 Criticism and Anticriticism

Overall the obtained findings of Paper 3 contribute substantially to research on hedonic adaptation and the effect of life events on satisfaction judgments. The following paragraphs address some limitations regarding a) the restriction of the considered sample, and b) the operationalization of the term "employment status" in the subgroup analyses (see also Paper 3 for more detailed and further discussion).

Paper 3 shows restrictions with respect to the way in which individuals were followed in the years after the considered life event. I only examined parents' courses of life satisfaction with one child and, thus, systematically excluded families with two or more children within the considered sampling period. Families deciding to have more children shortly after the birth of the first child were dropped from our analyses. Assuming that especially parents who are particularly satisfied after their transition into parenthood decide to grow their family, the results may systematically underestimate the positive effects of childbirth. On the other hand, the results may also overestimate the positive effects of childbirth on life satisfaction and domain satisfactions: The considered subgroup of parents having only one child within the observation window may differ systematically from parents having two or more children with respect to demographic characteristics. Assuming that especially older parents are more likely to have only one child due to biological and normative restrictions and assuming that older compared to younger parents are, on average, happier about the birth of their first child (Myrskyla & Margolis, 2014), the present results may also possibly overestimate the positive effects of childbirth. To conclude, no final answer can be given whether the respective subsample substantially biased the present results, and future research should, therefore, be more focused on these specific sample characteristics.

Paper 3 also includes analyses with restricted subsamples of employed, unemployed, and changing employed women, whereby especially the latter refers to a very specific subgroup (see Paper 3 for more details). While presenting these limitations, one should always keep in mind that restrictions and limitations are necessary in any empirical endeavor. Focusing on a defined research framework and, thus, being selective on, for example, which individuals and which subsamples are considered, is both vital and poignant for research.

5.2.3 Final Considerations

Paper 3 extends on previous work by focusing not only on life satisfaction but also on possible spillover effects to other domain satisfactions. This is clearly a crucial advantage.

However, one should still keep in mind that I only considered *one* facet of subjective well-being, namely the cognitive component, including life satisfaction and domain satisfactions. The affective component, that is, the amount of positive and negative affect, is not considered at all. The cognitive and the affective component of subjective well-being differ systematically (e.g., Andrews & Withey, 1976; Diener et al., 2013; Eid & Diener, 2004; Lucas et al., 1996; Kahneman & Deaton, 2010; Schimmack et al., 2008). This also holds true for the transition into parenthood. For example, Luhmann et al. (2012) showed that whereas the transition into parenthood has either negative or no effects on the cognitive component in the long run, childbirth can still have slightly long-lasting positive effects on the affective component. Results of Paper 3 solely apply to cognitive evaluations of one's own life, and deliberately leave out any considerations about affective consequences of childbirth.

Similar to this limitation, the effect of childbirth also cannot be transferred and applied to broader conceptualizations of happiness. Subjective well-being including both a cognitive and an affective part as defined by Diener (1984), does not capture all possible facets of happiness. For example, *meaning in life* can also be an important factor for happiness (Baumeister, Vohs, Aaker, & Garbinsky, 2013). Leading a meaningful life and a hedonic life differ, and consequently, research has directly appealed to these differences (e.g., Baumeister et al., 2013). The authors found, for example, that satisfying one's needs increased the hedonic parts of happiness, but not meaningfulness and whereas meaningfulness had more focus on integrating the past, hedonic happiness was more present oriented. Moreover, meaningfulness went more with being a giver rather than a taker. The latter point seems particularly important in the context of raising children. Parents can clearly be more considered as givers rather than as takers, and this holds especially true in the first years after the transition into parenthood, when children are completely dependent on parental care. In short, Paper 3 allows for clear statements about how the transition into parenthood impacts

life satisfaction and domain satisfactions, but cannot draw inferences about the influence on emotions or about meaning in life.

5.2.4 What Can We Learn? Some Practical Considerations

Research addressing hedonic adaptation (Diener et al., 2006; Headey & Wearing, 1989; Lykken & Tellegen, 1996) provide an unfavorable outlook for the decision to have children in general. Hedonic adaptation seems to mercilessly kick in, and in the best-case transition into parenthood may have no lasting effects on satisfaction levels. In the worst-case, however, permanent declines in satisfaction with some domains may emerge. If parents base their decision to have children solely on expecting increased satisfaction levels, they will probably stop having more than one child. Due to their past experiences, they would know that having a child does not permanently increase satisfaction. The fact that children do not lead to sustainably higher satisfaction levels also holds true not only for the first child, as discussed here exclusively, but also for the second child (Myrskyla & Margolis, 2014), and for the third child the authors found no further positive increases around birth. Similarly, when individuals observe in close peers rapid adaptation processes after childbirth to pre-birth baseline satisfaction levels they may probably drop their wish for children completely.

Many people expect to increase their satisfaction by having a child, or more generally, by reaching something important in their life such as getting a new job or a promotion, to graduating from college or getting married, and so on. Generally, this does not seem like a fruitful way to sustainably increase satisfaction. Probably not the accomplishment of certain milestones - because individuals would adapt to these milestones anyway - but the saying "The journey is the reward" holds true in the area of satisfaction and happiness (see also research on affective forecasting, e.g., Wilson & Gilbert, 2005; Wilson, Wheatley, Meyers, Gilbert, & Axsom, 2000).

Fortunately, as Paper 3 clearly demonstrates the inevitable anticipation-adaptation courses in satisfaction may be just part of an aggregate effect. The reversed u-shaped courses

in satisfaction judgments over time that summarize either many subgroups or many judgmental domains may sometimes be misleading. One of the main contributions of Paper 3 is to keep a differentiated view on the effects of the birth of the first child on satisfaction.

Furthermore, luckily, satisfaction is not the only aspect individuals may consider in such important decision situations. Even when having children does not increase life satisfaction and domain satisfactions sustainably, it still may contribute to positive emotions and a meaningful life and, therefore, may still promote decisions in favor of having children.

5.3 Added Value of Large N Survey Data in Psychological Research

Findings of all three papers are (partially) based on data from a large *N*, nationally representative sample of the German population, namely the Socio-Economic Panel (Wagner et al., 2007). Such data sets have been commonly used in sociology, political sciences, and economics, but in psychological research, the wealth of existing data sets has often not been sufficiently considered (Rammstedt & Spinath, 2013). However, using large *N* data provides several benefits for psychological research (e.g., Hofferth, 2005).

First, and probably most importantly, data quality of available large *N* data is mostly high because most data sets are a) representative for the German (or other nations') population and b) often longitudinal. Psychological data do not always offer these specific benefits or can only be collected with a substantial investment of both financial and temporal resources.

The use of a) representative data reduces the possibility that effects only emerge due to specific characteristics of the respective sample (see Henrich, Heine, & Norenzayan, 2010, for a discussion about the consequences of the wide-spread use of student samples in psychological research). With some certainty, results of all three papers are not due to specific characteristics of the respective sample and can be considered as general and reliable effects. Moreover, effects found with experimental data as in Paper 2, can be validated by additional analyses with representative samples.

Furthermore, Paper 1 and Paper 3 both offer b) longitudinal analyses which would not have been possible without the use of Socio-Economic Panel data; or at least it would have been very time consuming and expensive to create a comparable data set. Especially, tracking changes in satisfaction levels *before* the transition into parenthood is a particular advantage of the used survey data because surveys mostly only start when something has already happened and do not consider developments before a particular event.

Second, even small effects have a chance to be detected because power is high in large *N* data. *Third*, data from specific subgroups are available, for example, in my research, subgroups of employed, unemployed, and changing employed women getting a child.

Last, but not least, using representative large *N* survey data also satisfies the need for conceptual replications and validations in the discussion on assuring the quality in psychological research which has been challenged recently (e.g., Maxwell, Lau, & Howard, 2015; Open Science Collaboration, 2015; cf. Stroebe & Strack, 2014). Considering debates about the replication crisis and a general lack of trust in psychological findings, an open source approach with high quality large *N* survey data promotes *transparency* and offers, in some cases, possibilities to *validate* experimental research with representative large *N* survey data. This might constitute a fruitful way to redeem social psychology's reputation in the field (see Bless & Burger, 2016, for a detailed discussion that addresses some of the current challenges on the reliability and generalizability of experimental findings).

Despite their advantages, the reliance on representative large *N* survey data is often associated with the disadvantage that not all psychologically interesting variables are assessed. Representative large *N* survey data mainly focus on demographic and socio-economic related information, and only few - from a psychological point of view - interesting variables are provided. For example, even though the Socio-Economic Panel measures variables, such as personality traits or the frequency of emotions, variables directly addressing or testing cognitive processes are not generally assessed (Wagner et al., 2007). That is why

research in Paper 1 cannot give a conclusive answer regarding which mechanism was driving the observed pattern. Only experimental designs can systematically test for the assumed causal mechanism, as demonstrated in Paper 2 with a systematical variation of the question order in the experiment.[4]

Combining survey data and experimental data can lead to more added value and bring deeper insights. In this respect, different approaches can increase the reliability of results by combining the unique strengths of different approaches and compensating each other's weaknesses. For instance, demonstrating a reliable effect within a representative sample plus showing the underlying mechanism in an experiment allows me to make quite powerful inferences, as demonstrated in this dissertation.

5.4 General Summary and Conclusions

The present research appeals to the role of domain negativity and life events on general life satisfaction judgments. Specifically, Paper 1 provides the first systematic investigation that addresses the role of negativity in the relationship between several domain satisfactions and life satisfaction based on representative data. The particular influence of low satisfaction domains converges with prior research on negativity bias (Baumeister et al., 2001; Rozin & Royzman, 2001), and the present results, therefore, constitute a powerful demonstration of the negativity bias in the area of satisfaction and happiness - an area which has attracted considerable academic and public interest (Diener, 2000). Building on the negativity effect, Paper 2 relying on experimental data shows that the pronounced impact of domain negativity can be attributed to increased accessibility of negative information, which is in line with judgmental models of subjective well-being (Schwarz & Strack, 1999). Moreover, Paper 3 forcefully demonstrates that hedonic adaptation might hold true on average, but not necessarily when looking at domain satisfactions or subgroups separately.

[4] Please note that large *N* survey data also may include a systematic variation of the order in which items are assessed (e.g., Deaton & Stone, 2016) - including both advantages of experimental designs and large *N* surveys.

All papers, thus, offer useful contributions to research on how individuals form their life satisfaction judgments and which potential impact, such as domain negativity or critical life events, influence these reports. This is central because life satisfaction judgments serve as widely-used indicators of subjective well-being in surveys and in organizations, and even guide political decisions.

6 Research Papers

6.1 Paper #1: The More Negative the More Impact

6.1.1 Original Paper

Original Article

The More Negative the More Impact

Evidence From Nationally Representative Data on the Relation Between Domain Satisfactions and General Life Satisfaction

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Abstract: The present research investigates the relation between different domain satisfactions (e.g., health, income, etc.) and overall life satisfaction. Based on theorizing on the differences between positive and negative information, we assumed that specific domain satisfactions particularly are correlated with overall life satisfaction when the specific domain satisfactions (a) are low rather than high and (b) have declined rather than increased. Relying on a nationally representative sample of the German population (Socio-Economic Panel), we tested these considerations with both a cross-sectional and a longitudinal design. The findings strongly support that the more negative the domain satisfaction the more pronounced was the relation between domain and overall life satisfaction – both when negativity was assessed relative to other domains as well as when negativity was assessed relative to prior satisfaction with the same domain.

Keywords: life satisfaction, domain satisfaction, accessibility, negativity bias, SOEP

Researchers' interest in investigating individuals' subjective well-being has experienced a dramatic increase over the last decades (for overviews see, e.g., Diener, 2013; Diener, Oishi, & Lucas, 2003; Diener, Suh, Lucas, & Smith, 1999; Lyubomirsky, 2001; Ryan & Deci, 2001). This interest has spread across different fields, such as sociology, psychology, and economics, and has been inspired by observations that subjective well-being plays a crucial role for many aspects of individuals' behavior on very different levels. Across the different fields, it is assumed that subjective well-being represents people's evaluations of their life – both in terms of cognitions (my life is satisfying) and feelings (my experiences are pleasant and rewarding; see e.g., Diener, 2012). Life satisfaction refers to the cognitive component of subjective well-being and is typically considered as the gold standard for measuring subjective well-being. Not surprisingly, life satisfaction is investigated not only in experimental research but also in influential surveys (e.g., World Values Survey, General Social Survey, Socio-Economic Panel) and in important organizations (e.g., OECD) and has been discussed as an indicator that guides political decisions, for example, in the UK (Matheson, 2011) or France (Stiglitz, Sen, & Fitoussi, 2009).

Profound overviews (Diener et al., 1999, 2003) suggest that life satisfaction is related to a wide spectrum of variables, for example, *socio-demographic* or *socio-economic variables* (e.g., Blanchflower & Oswald, 2008; Diener, 2012; Frey & Stutzer, 2002), to *personality traits* (DeNeve & Copper, 1998), or *social* and *behavioral activities* (Myers, 1999; Penedo & Dahn, 2005; Stutzer & Frey, 2008).

Domain Satisfactions and Overall Life Satisfaction: General Overview

People's life satisfaction may reflect their satisfaction with different specific domains and that those domains include a broad spectrum of different life areas. For example, Cummins (1996) proposed seven different domain satisfactions: material, health, productivity, intimacy, safety, community, and emotional satisfaction (see also Argyle, 2001). Not surprisingly, domain satisfactions have been found to be strongly related to overall life satisfaction. In a meta-analysis, Heller, Watson, and Ilies (2004) found that overall life satisfaction correlated substantially with specific domain satisfactions, whereas the domain satisfactions were only weakly linked to each other. Moreover, cross-cultural studies suggest that satisfaction with self, family, friends, and finances is correlated moderately with life satisfaction across all nations (Diener & Diener, 1995).

Though overall one ought to expect a relation between specific domains and overall life satisfaction, the specific nature of this relationship may differ from situation to

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situation and from individual to individual. Capturing this idea, Oishi, Diener, Suh, and Lucas (1999) proposed in their value-as-a-moderator model that the relationship between different domain satisfactions and overall life satisfaction is moderated by values such as power, achievement, tradition, and conformity. They showed, for example, that individuals who consider achievement as an important value in life have a stronger relationship between satisfaction with grades and overall life satisfaction than do those individuals who consider achievement as a less important value. Related research has focused on other moderating variables and has identified age (e.g., Cheng & Chan, 2006) and gender (e.g., Albert, Labs, & Trommsdorff, 2010), among others.

Interestingly, rather little attention has been paid to why particular domains become more or less important for some individuals or in some situations. Focusing on this relation between general life satisfaction and satisfaction with specific domains, we propose that the contribution of specific domain satisfactions to general life satisfaction varies, and that, those domains with which we are least satisfied have the strongest influence on our general life satisfaction.

Though not addressing this point directly, two examples play into this assumption. First, Diener and Diener (1995) have demonstrated that in poorer countries, individuals' financial satisfaction correlated strongly with their overall life satisfaction compared to those in richer countries. If individuals in poorer countries are more dissatisfied with their financial satisfaction, the observed finding supports the notion that domains with low satisfaction are particularly associated with overall life satisfaction. Second, whereas health, in general, influences overall life satisfaction (Diener, 1984), satisfaction with health is particularly important for older adults and chronically ill individuals (Campbell, Converse, & Rodgers, 1976). Again, if older adults and chronically ill individuals are less satisfied with their health, the observed relation may reflect that domains with low satisfaction are particularly associated with overall life satisfaction. In other words, these findings point to the possibility that relative *negativity* may influence the strength of the relationship between domain satisfactions and overall life satisfaction.

Negativity Bias and Life Satisfaction

In a highly cited paper, Baumeister, Bratslavsky, Finkenauer, and Vohs (2001) concluded that "bad is stronger than good." This statement reflects a general negativity bias that describes a tendency of negative (compared to positive) information (e.g., events, objects, traits) to have a stronger impact on individuals (Fiske, 1980; Rozin & Royzman, 2001). With respect to subjective well-being, for example, Sheldon, Ryan, and Reis (1996) found that participants had worse days when they had felt sadder the day before, whereas participants did not have better days when they had reported more positive affect or vitality the day before. Converging evidence suggests that negative events, such as stress, impaired immunological health, whereas no benefits of stress-reduction techniques on immunological health have been found (Cohen & Herbert, 1996). Similarly, individuals may suffer from a tragic event for their whole life (trauma), whereas positive events do not have such extreme consequences (Baumeister et al., 2001). These findings are consistent with one of the core insights from prospect theory, that losses loom larger than gains (Kahneman & Tversky, 1979; see however, Walasek & Stewart, 2015).

General Asymmetry of Positive Versus Negative Information

The evidence on differences between positive and negative information is not specific to judgments of life satisfaction but reflects the general notion that positive and negative information cannot be considered identical but differ fundamentally in their nature and their properties (for overviews see, Alves, Koch, & Unkelbach, 2017; Peeters & Czapinski, 1990; Skowronski & Carlston, 1989). One account holds that positive and negative information is asymmetrically distributed along the positive-negative dimension (Alves et al., 2017) and that positive information is usually more densely located than negative information. In other words, positive information is more alike than negative information (Alves, Koch, & Unkelbach, 2016). This difference is due to a nonlinear relationship between information and valence. For example, while precision and accuracy is usually evaluated positively, being very, very precise is not necessarily evaluated positively but pedantic. This distribution property restricts the range of positive information more than the range of negative information, and positive information is less likely to be extreme than negative information (Alves et al., 2017). Evidence for the assumption that positive information is more alike than negative information has been demonstrated across different domains, for example, face evaluations (Potter, Corneille, Ruys, & Rhodes, 2007) or attitude judgments (Gershoff, Mukherjee, & Mukhopadhyay, 2007).

The documented asymmetry of positive versus negative information has a wide array of consequences on information processing. Directly relevant for the current discussion on the relation between domain satisfactions and overall life satisfaction is research on how the positive-negative asymmetry influences *information integration*. If positive information is more densely represented, then there is more overlap and more redundancy (Alves et al., 2017).

Thus, everything else being equal, any given piece of positive information should exert less influence on integrative judgments than any given piece of negative information. Empirical support for this assumption is, for example, documented in research that systematically manipulated the valence of potentially judgment relevant information and observed an increased impact of negative information (see, Skowronski & Carlston, 1987; for overviews see, Peeters & Czapinski, 1990; Skowronski & Carlston, 1989; for evidence pertaining to physiological responses, see Ito, Larsen, Smith, & Cacioppo, 1998). Note that the increased impact of negative information may result from various properties of negative information. In this respect, negative information is more likely to be extreme – and everything else being equal, extreme information has a stronger impact on integrative judgments than moderate information (Fiske, 1980; for potential caveats see Bless & Schwarz, 2010).

Negative information exerts its influence not only via its increased diagnostic value, it also comes along with other processing advantages. Negative information captures more *attention* than positive information (e.g., Pratto & John, 1991). This particular attention may have a very *adaptive* function, as in many situations the additional attention is crucial for dealing with negative stimuli. Because more attention is usually going along with more elaboration, it increases *accessibility* when the information is recalled in subsequent situations. Thus, the additional attention is linked to improved *memory* for negative information (e.g., Robinson-Riegler & Winton, 1996; see however, Alves et al., 2015 for memory advantages independent of depth of processing).

In sum, positive and negative information can differ on various dimensions (e.g., diagnosticity, adaptiveness, extremeness, accessibility) that may – either in combination or as single influences – result in an increased impact of negative information on integrative judgments. Although the present research does not allow to disentangle the various dimensions we briefly address research focusing on the role of accessibility because – to the best of our knowledge – only this aspect has been systematically linked to the relation between domain satisfaction and overall life satisfaction (cf. Schwarz & Strack, 1999). For example, strong domain-overall correlations were observed when domain satisfactions were assessed immediately before overall life satisfaction whereas weak correlations were observed in the reversed order (Schwarz, Strack, & Mai, 1991; Strack, Martin, & Schwarz, 1988). Presumably, the difference between the correlations reflects that evaluating the domain satisfaction increased the accessibility of this aspect and was subsequently used for answering evaluating general life satisfaction (for related evidence, see also Oishi, Schimmack, & Colcombe, 2003). Similarly, addressing the relation between specific domains and overall satisfaction, Schul and Schiff (1993) proposed that negative information is usually more accessible (e.g., because it is more attention-grabbing) and that due to the increased accessibility negative domains exert a stronger influence on satisfaction judgments than positive domains. Consistent with these assumptions, the authors observed that the differential impact between negative and positive domains was diminished when, due to the experimental condition, the accessibility of both, positive and negative information was systematically increased by evaluating the specific domains directly before overall satisfaction was assessed.

The research discussed above points to a particular impact of negative information and that various properties of negative information can drive this influence. Importantly, all the addressed aspects suggest that people's negatively rated life domains might impact their overall life satisfaction more than their positively rated domains. We report on two studies that test this hypothesis by building on data from a representative national panel in which satisfaction for different domains as well as satisfaction for life in general was assessed. In Study 1, we tested the hypothesis that less satisfying domains exert a stronger influence on life satisfaction than satisfying domains.

In Study 2, we tested whether negative *changes* in domain satisfactions exert a stronger influence on life satisfaction than positive changes. We therefore assessed year-to-year increases and decreases in specific domain satisfactions. We compared the influence of a specific domain on life satisfaction for (a) individuals who experienced increases and (b) individuals who experienced decreases over time. We expected that domain satisfactions exert a particularly strong influence on judgments of overall life satisfaction when individuals experienced a decrease in that domain rather than an increase.

General Method

Data

Data were retrieved from the Socio-Economic Panel (SOEP), the largest household panel study in Germany. Since its start in 1984, the SOEP has focused on the analysis of life course and well-being measured by two types of indicators: objective income and subjective satisfaction (Wagner, Frick, & Schupp, 2007).

Measures

The analyses below focused on general life satisfaction and on the following 10 specific domain satisfactions: satisfaction with health, sleep, work, household role, household

income, personal income, dwelling, spare time, family life, and living standard. Satisfaction with child care possibilities was excluded from the analyses as it only assessed individuals with children of preschool age, and therefore represents a very specific subgroup of individuals.

Overall life satisfaction ("How satisfied are you with your life, all things considered?") as well as domain-specific satisfactions ("How satisfied are you with …?") were assessed with single items on an 11-point rating scale (ranging from 0 = "*completely dissatisfied*" to 10 = "*completely satisfied*"). Despite single-item measurement that is used in most representative surveys, the respective reliabilities are usually relatively good. For example, Lucas and Donnellan (2012) found that single-item measurement of life satisfaction had a retest reliability of about .60 in four nationally representative studies, including the SOEP (see also Schimmack, 2009). Participants responded to the domain satisfaction questions in the very beginning of the questionnaire whereas overall life satisfaction was assessed at the end of the survey. Because a large number of different questions (e.g., 157 questions for the year 2013, comparable amount of questions for the other considered years) was asked between domain satisfactions and life satisfaction assessment, we assumed that potential accessibility effects that resulted from the assessment of the specific domains were no longer effective when the overall judgment was made.

Study 1: Do Less Satisfying Domains Exert More Influence on Life Satisfaction Than Satisfying Domains?

Method

Participants

For Study 1, we used data from the 2013 SOEP, the most recent wave of the time of analyses. The overall sample (52% female, 48% male) had an age range from 17 to 99 years, with a mean age of 50.32 years (SD = 18.50). About 21% of the sample had a higher education (Comparative Analysis of Social Mobility in Industrial Nations [CASMIN]) classification: lower or higher tertiary education). Over half of the participants were married (51%), whereas over a quarter were single (30%). The remaining individuals were distributed in other categories (e.g., married but living separately, or widowed). Sample size ranged from N = 24,058 (e.g., age) to N = 13,898 (satisfaction with job) due to filter variables (job satisfaction was assessed for individuals with jobs only) or other randomly missing data.

Data Analyses Overview

In Study 1, we tested the influence of domain negativity on life satisfaction in a cross-sectional design. We followed two different approaches that differ in their focus. First, we determined the influence of ranked domain satisfactions (from least satisfied to most satisfied domain satisfaction) on life satisfaction in a multiple regression analysis. This *within-participant* analysis focused on the individual perspective and examined within participants whether the domain with the least satisfaction exerts a stronger influence on life satisfaction than the domain with the most satisfaction independent of which domain was the lowest or the highest in each individual. Note that this approach potentially confounds type of domain and negativity. Assume, for example, that most participants are least satisfied with their income and that the income domain is most strongly correlated with overall satisfaction. In this case, we could not tell whether the strong correlation is due to negativity or due to type of domain (here income). To address this issue, in a second approach we compared the influence of domain satisfactions on overall life satisfaction for those individuals who rated a specific domain satisfaction as most dissatisfying – rather than most satisfying – relative to their other domain satisfactions. This analysis drew attention to the *domain* perspective (e.g., does health satisfaction correlate more strongly with life satisfaction when we compare between individuals who are least vs. most satisfied with their health).

Results and Discussion

Descriptive Statistics

The basic descriptive statistics for the different domain satisfactions and life satisfaction (means and standard deviations in parentheses), as well as their bivariate correlations, are presented in Table 1. The average person was highly satisfied with his or her life (M = 7.16, SD = 1.79). Individuals were least satisfied with their personal income (M = 6.16, SD = 2.53) and most satisfied with their dwelling (M = 7.81, SD = 1.94).

All 10 domain satisfactions were positively associated with life satisfaction. Correlations with overall life satisfaction varied between r = .35 (p < .001) for satisfaction with spare time, and r = .56 (p < .001) for satisfaction with living standard. In sum, all indices reflect that the higher the domain satisfactions, the higher the overall life satisfaction.

Within-Participants Focus

To examine whether the influence of different domain satisfactions on life satisfaction depends on domain negativity with the within-participants approach, domain negativity was operationalized by ranking all domain satisfactions *within* each person. The lowest, the second lowest,

Table 1. Descriptive statistics and correlations among overall life satisfaction and domain specific satisfactions

	M (*SD*)	LS	Health	Sleep	Job	HH role	HH income	Income	Dwelling	Spare time	Family life	Living standard
LS	7.16 (1.79)	1										
Health	6.62 (2.31)	.50***	1									
Sleep	6.71 (2.32)	.39***	.52***	1								
Job	7.05 (2.17)	.46***	.43***	.39***	1							
HH role	6.83 (1.99)	.36***	.36***	.33***	.29***	1						
HH income	6.59 (2.32)	.47***	.33***	.30***	.40***	.36***	1					
Income	6.16 (2.53)	.43***	.30***	.27***	.44***	.31***	.79***	1				
Dwelling	7.81 (1.94)	.36***	.23***	.29***	.27***	.35***	.43***	.37**	1			
Spare time	7.23 (2.18)	.35***	.24***	.31***	.27***	.36***	.30*	.26***	.43***	1		
Family life	7.80 (2.01)	.47***	.32***	.32***	.30***	.37***	.36***	.29***	.42***	.41***	1	
Living standard	7.46 (1.97)	.56***	.38***	.35***	.41***	.38***	.71***	.60***	.54***	.40***	.56***	1

Notes. LS = Overall life satisfaction; HH = Household. Job satisfaction only full-time employed. *$p < .05$; **$p < .01$; ***$p < .001$.

the third lowest, and so forth, domain satisfaction for each individual were entered into a multiple regression analysis predicting overall life satisfaction.[1]

The results displayed in Table 2 reflect a stronger influence of lowest (and lower) domain satisfactions compared to the highest (and higher) domain satisfactions. To test whether the standardized β-weights for the lowest domain satisfaction (β = .115) and for the highest domain satisfaction (β = .054) were statistically different from each other, their corresponding 95% confidence intervals (CI) were estimated via bias-corrected bootstrap (1,000 resamples). The confidence intervals for the highest and the lowest domain satisfaction were not overlapping, which indicates that the two estimates were significantly different (for detailed discussion of the relationship between confidence intervals and statistically significance testing see, e.g., Cumming & Finch, 2005). The third lowest domain satisfaction pronounced the strongest influence on life satisfaction (β = .134), however it showed a huge overlap with the lowest domain in their respective 95% CI ([.091, .175] vs. [.093, .138]). In sum, the obtained findings support the hypothesis that individuals' lowest satisfaction influences overall life satisfaction more strongly than the domain with which one individual had been most satisfied with, no matter what specific domain satisfaction is considered as the least satisfying domain. Additional analyses revealed that this pattern of finding remained stable when we additionally controlled for common socio-economic and demographic variables.[2] Moreover, when we performed the reported analyses separately for male and female participants, that is, on two independent subsamples, we obtained very similar patterns – which supports the stability of the pattern.

Table 2. Results of multiple regression analysis predicting life satisfaction by ranked domain satisfactions

	β	95% CI
1. Lowest domain satisfaction	.115***	[.093, .138]
2. Lowest domain satisfaction	.088***	[.053, .122]
3. Lowest domain satisfaction	.134***	[.091, .175]
4. Lowest domain satisfaction	.093***	[.046, .141]
5. Lowest domain satisfaction	.094***	[.044, .144]
6. Lowest domain satisfaction	.073***	[.025, .122]
7. Lowest domain satisfaction	.054***	[.011, .094]
8. Lowest domain satisfaction	.047***	[.012, .085]
9. Lowest (= highest) domain satisfaction	.054***	[.028, .080]

Notes. CI = confidence interval. Job satisfaction not included. ***$p < .001$.

Keeping Domain Constant – Comparing Between Participants

With the domain-specific approach we compared the influence of domain satisfactions on overall life satisfaction for those individuals who rated a specific domain satisfaction as most dissatisfying – rather than most satisfying – relative

[1] Please note that in this analysis we considered only nine domain satisfactions (not 10 domain satisfactions as in our preceding and following analyses). This reduction was due to the strong filter of the job domain satisfaction. As job satisfaction was only assessed for individuals with a current employment including the job satisfaction variable would have necessarily reduced our sample to employed individuals only and would have led to systematic missing values in the ranked domain satisfactions.

[2] As indicators of *socio-economic status*, we included income (logarithm of income) and education (years of education). As *demographic* control variables, we included age and age-squared (Blanchflower & Oswald, 2008; see also Luhmann, Lucas, Eid, & Diener, 2012). Moreover, we controlled for possible regional differences in life satisfaction and took into account whether an individual currently lived in Eastern or Western Germany because individuals usually report higher satisfaction in Western compared to Eastern Germany, both for life in general as well as for all specific domains (Statistisches Bundesamt, 2008).

Table 3. Correlations between overall life satisfaction and domain satisfaction for least satisfying and most satisfying domains (N in parentheses)

	Correlation with life satisfaction		
	Minimum	Maximum	Minimum > Maximum
Health satisfaction	.60*** (6,732)	.46*** (5,185)	✓***
Sleep satisfaction	.53*** (5,597)	.44*** (5,308)	✓***
Job satisfaction	.60*** (1,879)	.57*** (2,411)	✓***
HH role satisfaction	.48*** (3,467)	.46*** (3,404)	✓
HH income satisfaction	.59*** (6,424)	.49*** (4,677)	✓***
Income satisfaction	.50*** (7,206)	.50*** (3,406)	✓
Dwelling satisfaction	.54*** (2,576)	.44*** (11,384)	✓***
Spare time satisfaction	.55*** (3,788)	.39*** (7,165)	✓***
Family life satisfaction	.62*** (2,006)	.45*** (9,957)	✓***
Living standard satisfaction	.71*** (2,194)	.50*** (7,727)	✓***

Note. HH = Household. ***$p < .001$.

to their other domain satisfactions. First, we determined the lowest value within the 10 domain satisfactions on an individual level. For example, if an individual was most dissatisfied with his or her health (relative to the other domains), the domain *health* and its value were defined as his or her minimum domain. If an individual had more than one value at the lowest level, all these domains were taken into consideration for calculations with his or her minimum domain.[3] Second, we determined the highest value of an individual in his or her satisfaction domains. For example, if an individual was most satisfied with his or her health (relative to the other domains), the domain health and its value were defined as the maximum domain. Again, if an individual had more than one value at the highest level, all these domains were analyzed. Necessarily, *N* varied heavily. For example, relatively few individuals were most dissatisfied with their family life or their dwelling, and relatively few individuals were most satisfied with their personal income. Moreover, typically fewer individuals were in the minimum domain rather than in the maximum domain.

For the main analyses, we compared correlations of each domain with overall life satisfaction when the domain was the least satisfying versus when the domain was the most satisfying domain. Satisfaction with job was analyzed only for full-time employees, to ensure that job played an equivalent role with all individuals. This resulted in 10 comparisons between minimum and maximum correlations. For the comparison between minimum and maximum correlations we transformed correlation coefficients to Fisher's *z* scores.

Table 3 shows the correlations between domain satisfactions and overall life satisfaction, the correlations when the domain is defined as minimum, and the correlations when the domain is defined as maximum. Moreover, the table provides information about the significance of the observed differences between minimum and maximum.

The analyses revealed that all 10 correlation comparisons reflect the expected pattern and that eight out of these 10 comparisons were statistically significant. Specifically, the relation between overall life satisfaction and satisfaction with the specific domain was more pronounced when individuals reported the least, rather than the most, satisfaction for the respective domain. For example, we observed that the correlation of satisfaction with health and general life satisfaction increased significantly from $r = .46$ ($p < .001$) to $r = .60$ ($p < .001$), $Z = 10.99$, $p < .001$, when we compared individuals who ranked satisfaction with health at the highest versus lowest level. Nonsignificant differences in the expected direction were observed for satisfaction with personal income and for satisfaction with household role, though the effects were slightly in the expected direction.

For further testing these differences, we treated the two correlations for each domain as a pair and entered this pair into a *t*-test for dependent samples. On average, the overall mean for the minimum correlations between domains and general life satisfaction ($M = 0.57$, $SE = 0.067$) was higher than the overall mean for the maximum correlations ($M = 0.47$, $SE = 0.048$). This difference was significant, $t(9) = 4.64$, $p = .001$).

Additional analyses revealed that this pattern of finding remained stable when we additionally controlled for common socio-economic and demographic variables (see Footnote 2). These findings suggest that the observed pattern is not due to differential relations of the least versus

[3] 13,610 individuals had one exclusive minimum and 8,643 individuals had one exclusive maximum.

maximum conditions with demographic and socio-economic variables. Moreover, the same pattern of findings was observed for the male and female subsamples.

In combination, the findings obtained in Study 1 support the hypothesis that individuals' satisfaction with a specific domain correlates more strongly with individuals' overall life satisfaction when the specific domains were perceived as most dissatisfying rather than most satisfying.

Study 2: Do Negative Changes in Domain Satisfactions Exert More Influence on Life Satisfaction Than Positive Changes?

The results of Study 1 are based on cross-sectional, static analyses. One way to extend and strengthen the results of Study 1 is to focus on the longitudinal perspective – namely, to test the effects of *changes* in the domain satisfactions on overall life satisfaction. We expected a particularly strong influence of domain satisfactions on the judgment of overall life satisfaction when individuals experienced a decrease in a particular domain, rather than an increase.

Method

In Study 2, we conducted a fixed-effect regression to analyze the influence of changes in domain satisfaction on overall life satisfaction from 1992 to 2013. Fixed-effect regressions investigate how a within-person change in the independent variable (in our case the *change* in the domain satisfaction) is associated with a change in the dependent variable (in our case a *change* in the overall life satisfaction) (see Wooldridge, 2010). As data in Study 2 contain several measures of domain satisfactions and life satisfactions for every individual over time and thus, are organized in a long format design, common ordinary least squares (OLS)-regression analysis can lead to biased estimators. Fixed-effect regression estimators correct for this bias and account for unobserved heterogeneity in the data (for further discussions about longitudinal analyses, see Wooldridge, 2010). The starting point 1992 was selected as this was the first year the SOEP comprised samples of Eastern and Western Germany after the reunion. This led to 22 nationwide waves that we analyzed in our study. For the analyses, we included two central variables representing positive and negative changes: first, positive changes indicating domain satisfaction increase relative to the previous year; and second, negative changes indicating domain satisfaction decrease. As no changes in domain satisfactions were entered as zeros into the equations, the effect of constant domain satisfaction cannot be investigated with this type of analysis.

Table 4. Predicting life satisfaction with positive versus negative changes in domain satisfactions from a longitudinal perspective (*b*-weights and *SE* in parentheses)

	DS−	DS+	DS− > DS+
Δ Health satisfaction	.14 (0.002)***	.05 (0.002)***	✓***
Δ Sleep satisfaction	.09 (0.004)***	.03 (0.004)***	✓***
Δ Job satisfaction	.05 (0.004)***	.07 (0.004)***	***
Δ HH role satisfaction	.09 (0.003)***	.04 (0.003)***	✓***
Δ HH income satisfaction	.12 (0.002)***	.06 (0.002)***	✓***
Δ Income satisfaction	.08 (0.003)***	.05 (0.003)***	✓***
Δ Dwelling satisfaction	.11 (0.002)***	.03 (0.002)***	✓***
Δ Spare time satisfaction	.09 (0.002)***	.02 (0.002)***	✓***
Δ Family life satisfaction	.15 (0.004)***	.03 (0.004)***	✓***

Notes. *T* = 22 waves from 1992 to 2013. DS = domain satisfaction; HH = Household. ***$p < .001$.

In fixed-effect regressions all waves are present in the same analysis. Thus, the two variables indicating positive and negative changes in our analytical design included the complete information about the differences in all considered years.

As satisfaction with living standard was only assessed once (in 2013) we were not able to include this domain in our longitudinal analyses. In total, we conducted nine fixed-effect regressions separately for each of the nine considered domains.

Results and Discussion

The results confirmed our hypothesis. We found a significant influence of both positive changes and negative changes in domain satisfactions on life satisfaction from a longitudinal perspective. Comparing the two weights in the fixed-effect regression revealed a significantly stronger influence of negative changes compared to positive changes. The analyses revealed that eight out of nine correlation comparisons reflect the expected pattern and that all eight of the expected differences were statistically significant (see Table 4). The observation that losses had a stronger influence than gains is compatible with prospect theory (Kahneman & Tversky, 1979; see however Walasek & Stewart, 2015). A significant reversal was observed for job satisfaction.

Two additional analyses were conducted to statistically test the overall pattern. First, a sign test revealed a dominance of the expected differences (higher weights for decreases compared to increases, $p = .021$). Second, the overall mean for the decrease weights ($M = 0.10$, $SE = 0.032$) was higher than the overall mean for the

increase weights (M = 0.04, SE = 0.016), $t(8)$ = 4.64, p = .002.

Similar to Study 1, in subsequent analyses, we controlled for common demographic and socio-economic variables (see Footnote 2). As observed for Study 1, the results remained stable. Moreover, cross-validation of our results in two independent subsamples (males/females) revealed 16 out of 18 comparisons in the expected direction, again supporting the stability of the pattern.

General Discussion

In sum, the obtained findings supported our central hypothesis, which holds that specific domains are related particularly to overall life satisfaction when individuals are not satisfied with a specific domain. Specifically, we observed with a cross-sectional approach (Study 1) that correlations between specific domains and overall life satisfaction differed systematically as a function of whether the specific domain was perceived as least or as most satisfying. This general pattern was obtained in Study 1 for both, the within-participants approach as well as the domain-focused approach. In the within-participants approach we observed that the lower the satisfaction with a specific domain, the more strongly this domain satisfaction was related to overall satisfaction. The domain-focused approach avoids the potential confound of negativity and domain of the within-participant analyses and again demonstrates that correlations were reliably higher when the respective domain was considered as least satisfying relative to when the domain was considered as most satisfying. Because the domain-focused perspective compares the influence of least versus most satisfying domains between participants the within-participant hypothesis cannot be tested directly.

The findings obtained with a longitudinal approach (Study 2) again supported the general assumption that domains that are perceived as less satisfying exert a larger influence compared to satisfying domains. Specifically, when individuals experienced a decrease in satisfaction with a specific domain, this domain correlated more strongly with overall life satisfaction than when an increase in satisfaction was perceived.

Emphasizing the stability of the findings, the general pattern remained stable when the analyses controlled for common demographic and socio-economic variables, which addresses the potential argument that the observed pattern is due to individuals in the least versus maximum condition differ with respect to central socio-economic variables. Moreover, additional separate analyses for female and male participants revealed very similar results thus pointing to the stability of the effect across two independent subsamples.

The present approach holds several advantages. *First*, the findings are based on data from a large, nationally representative sample of the German population. Relying on representative samples eliminates the risk that obtained effects are potentially due to some particular aspects of the drawn sample. *Second*, the two variants, cross-sectional and longitudinal analyses, further support the reliability of the findings. Whereas in the cross-sectional analyses, negativity of a specific domain is assessed relative to other specific domains, negativity in the longitudinal analyses is assessed relative to the previous year. By focusing on the change aspect, the latter approach reduces the possibility that dynamics in other specific domains contribute substantially to the observed pattern (because, here, negativity is assessed via changes *within the same domain*; that is to say, independent of the satisfaction changes in other domains whereas in the cross-sectional approach, negativity is assessed relative to other domains).

Relation to Theorizing on Negativity

The observation that domains with less satisfaction are more strongly related to overall life satisfaction compared to domains which go along with higher satisfaction fits nicely with the outlined general models on the particular role of negative information. Across various domains, negative information has been demonstrated to be more influential than positive information (for overviews see, Alves et al., 2017; Baumeister et al., 2001; Fiske, 1980; Rozin & Royzman, 2001). Being based on cross-sectional and longitudinal representative samples, the current findings thus constitute a powerful conceptual replication of the negativity bias in a domain that has attracted considerably scientific (e.g., Diener, 2000) and public interest (e.g., Matheson, 2011).

The theoretical accounts attribute the increased impact of negative information to different aspects that all can be derived from the unequal distribution of positive and negative information such as diagnosticity and informativeness, extremity, adaptiveness, or accessibility (cf. Alves et al., 2017). Though coming along with many advantages, the reliance on representative data sets is often associated with the disadvantage that not all variables of theoretical interests were assessed. In our case, we would have been interested in data that more directly address the proposed role of diagnosticity, accessibility, adaptiveness, or extremity. Given the absence of related data, there is no conclusive answer as to which of the (often closely related) aspects was driving the observed pattern.

Although the potentially relevant concepts (diagnosticity, accessibility, adaptiveness, extremity) were not assessed, two of the candidates may deserve additional discussion.

First, the present data were presumably not driven by the extremity of the negative information. In fact, the ratings for the domains individuals were least satisfied with were not more extreme than the ratings for the positive domains, that is, means for most satisfied domains were closer to the endpoint of the scale than means for least satisfied domains.

Second, because prior research on the relation between specific domain satisfactions and overall life satisfaction has particularly focused on the role of accessibility (cf. Schwarz & Strack, 1999) this aspect may deserve some consideration. If we assume that negative information is often more attention grabbing and in turn more accessible (e.g., Pratto & John, 1991; Robinson-Riegler & Winton, 1996) then the present findings are compatible with prior evidence pointing to the influence of accessibility on the relation between domain satisfaction and overall satisfaction (Schul & Schiff, 1993; Schwarz et al., 1991; Strack et al., 1988). Again, we are aware that accessibility was not assessed in the present studies and that other properties of negative information may similarly account for the obtained pattern.

Independent of which property of negative information mediated the observed negativity bias, the present approach points to the usefulness of survey data. Although they often do not allow for testing mediating processes they constitute a powerful approach to address some of the current challenges on the reliability and generalizability of experimental findings (for a more detailed discussion see Bless & Burger, 2016).

Unexpected Findings and Caveats

While overall the obtained findings fit nicely with research on the particular role of negative information some aspects may deserve additional attention. *First*, one may wonder whether the least satisfying domains qualify as negative domains as most people provide satisfaction judgments above the scale midpoint (see Table 1). Note, these means comprise all judgments whereas our analyses were based on those judgments that reflected least satisfaction. As a result, the mean satisfaction for seven out of the 10 domains was below the scale midpoint (the remaining three were almost on the scale midpoint). Consequently, most of our minimum domain satisfactions were not only relatively negative but also absolutely negative when the scale midpoint is considered as a relevant threshold. Moreover, one may argue that evaluations are most often of relative nature and that evaluations crucially depend on which comparison standard is employed (cf. Bless & Schwarz, 2010). Note that while some of the explanatory constructs focus on absolute negativity (e.g., adaptiveness, see Baumeister et al., 2001) other constructs (e.g., diagnosticity, informativeness, accessibility) do not make such requirements but argue relative to the set of available information.

Second, similarly related to how domain satisfactions are distributed, due to the present approach, for some domains, we obtained skewed distributions that resulted in higher variances in the groups representing participants that were least (compared to most) satisfied with the respective domain. One might argue that this pattern in turn accounts for the observed differential correlations. Note that this distributional aspect is very much in line with the assumptions underlying many negativity effects (cf. Alves et al., 2017) and might in fact be part of the actual phenomenon. Nevertheless, in various ways we tried to reduce the potential impact of this caveat in our analyses. Specifically, the reported analyses that are based on the rank order at least in parts circumvented this problem and still resulted in the same conclusions.

Third, whereas, in general, the findings are quite supportive, we found unexpected patterns (across the two studies, one out of 19 comparisons was in the opposite direction and two out of 19 did not reach conventional significance levels). In Study 1, a nonsignificant effect was observed for satisfaction with personal income and satisfaction with household role. We assume that part of the problem results from the somewhat ambiguous wording of the question.[4] In Study 2, the unexpected pattern emerged for the domain job satisfaction.

Fourth, another potential alternative explanation could hold that some domains are important (e.g., income) but hard to satisfy whereas other less important domains (e.g., dwelling) can be satisfied more easily. If so, negative domains would have a more pronounced impact than positive domains, as observed, but this pattern would be due to domain importance rather than to negativity. Several observations render this alternative unlikely. In Study 2 negativity was inferred from positive versus negative changes of the same domain relative to the previous year but not relative to other domains. This identification of negative versus positive domains is logically independent of the relative importance of domains to each other. Moreover, the alternative explanation implies that the negativity effect is particularly pronounced for domains with low satisfaction (e.g., income, $M = 6.16$, see Tables 1 and 3). A combined look at Tables 1 and 2 reveals that this is not the case. In fact, correlating the mean domain satisfactions (see Table 1) with the magnitude of the effect

[4] The exact wording of the question reads: "How satisfied are you with your role in the household?", which, in fact, might result in very different interpretations by participants.

(difference in correlations when individuals are least or most satisfied with the respective domain, see Table 3) reveals a tendency that the effect is more pronounced for domains individuals are satisfied with. Though this effect is not significant, the direction of the pattern speaks clearly against the alternative account.

Moreover, one might assume that in analyses that are based on such large data sets, almost any difference is likely to reach conventional levels of significance. Note, however, that although our data represent a very large and therefore powerful data set, our statistical inferences rely on a small set of predicted comparisons (19 for both Studies 1 and 2). The size of the observed effect can be best estimated from Study 1, where we observed an average correlation of .44 versus .55 for the domain with the most, versus the least, satisfaction.

Implications for Research on Subjective Well-being

The present research contributes to the literature on subjective well-being in various ways. *First*, to the best of our knowledge, the reported studies provide the first systematic investigation that addresses the role of negativity in the relationship between several domain satisfactions and life satisfaction, based on a representative sample. The particular influence of low satisfaction domains converges with prior research on the relation between income and general life satisfaction. This research suggests that income exerts a stronger influence on life satisfaction when income is low rather than high (e.g., Diener & Diener, 1995; Kahneman & Deaton, 2010). Relatedly, satisfaction with health was particularly strongly related to general life satisfaction in populations that are likely to suffer from health problems (e.g., Campbell et al., 1976). In combination, the current data suggest that such effects are not restricted to income or health but reflect a more general pattern according to which domains individuals are not satisfied with bear a stronger influence on general life satisfaction than domains individuals are satisfied with.

Second, the results suggest that the relation between specific domain satisfactions and overall life satisfaction is unlikely to be stable either between or within individuals. The cross-sectional analyses indicate that some domains may be more strongly related to overall life satisfaction for some individuals than for others – and that satisfaction with the domain may play a crucial role for this between-subjects variance. Moreover, the longitudinal analyses suggest that the relative contribution of a particular domain may vary over time – and that, again, satisfaction with the domain may play a crucial role for this within-subjects variance.

Third, when relating the obtained findings to prior research one might raise the question whether the observed correlation differences between the least and most satisfying domain reflect different experiences of individuals and/or whether these differences reflect judgmental processes when individuals are required to provide a complex evaluation of their life within a very short time. We readily admit that the present data do not allow for a thorough answer of this question. Independent of the answer, however, judgments of life satisfaction assessed in a very similar fashion are widely used to investigate causes and consequences of individuals' well-being, and this highly warrants to investigate the formation of these judgments.

More generally, the present data offer a somewhat unfortunate perspective. Whereas evolutionarily, the focus on negative aspects may constitute an important and crucial element, at the same time, this presumably often necessary focus reduces individuals' overall life satisfaction. Given this constellation, one may speculate about how individuals may increase their satisfaction with life. One option is to improve the satisfaction with specific domains by focusing on those domains with which individuals are least satisfied. Increasing satisfaction with these domains will contribute most to improving life satisfaction overall. This may hold for personal attempts (e.g., engaging in physical activities to improve health) as well as for initiatives on a societal or political level (e.g., improving the health care system).

Conflict of Interest

The authors declare that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

Albert, I., Labs, K., & Trommsdorff, G. (2010). Are older adult German women satisfied with their lives? *GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry, 23*, 39–49. doi: 10.1024/1662-9647/a000002

Alves, H., Koch, A., & Unkelbach, C. (2016). My friends are all alike – The relation between liking and perceived similarity in person perception. *Journal of Experimental Social Psychology, 62*, 103–117. doi: 10.1016/j.jesp.2015.10.011

Alves, H., Koch, A., & Unkelbach, C. (2017). Why good is more alike than bad: Processing implications. *Trends in Cognitive Sciences, 21*, 72–82. doi: 10.1016/j.tics.2016.12.006

Alves, H., Unkelbach, C., Burghardt, J., Koch, A. S., Kruger, T., & Becker, V. D. (2015). A density explanation of valence asymmetries in recognition memory. *Memory & Cognition, 43*, 896–909. doi: 10.3758/s13421-015-0515-5

Argyle, M. (2001). *The psychology of happiness*. London, UK: Routledge.

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5*, 323–370. doi: 10.1037/1089-2680.5.4.323

Blanchflower, D. G., & Oswald, A. J. (2008). Is well-being U-shaped over the life cycle? *Social Science & Medicine, 66*, 1733–1749. doi: 10.1007/s11205-011-9903-9

Bless, H., & Burger, A. M. (2016). A closer look at social psychologists' silver bullet: Inevitable and evitable side effects of the experimental approach. *Perspectives on Psychological Science, 11*, 296–308. doi: 10.1177/1745691615621278

Bless, H., & Schwarz, N. (2010). Mental construal and the emergence of assimilation and contrast effects: The inclusion/exclusion model. *Advances in Experimental Social Psychology, 42*, 319–373. doi: 10.1016/S0065-2601(10)42006-7

Campbell, A., Converse, P. E., & Rodgers, W. L. (1976). *The quality of American life: Perceptions, evaluations, and satisfactions*. New York, NY: Russell Sage Foundation. doi: 10.1017/S0008423900050976

Cheng, S.-T., & Chan, A. C. (2006). Relationship with others and life satisfaction in later life: Do gender and widowhood make a difference? *Journal of Gerontology, 61B*, 46–53. doi: 10.1093/geronb/61.1.P46

Cohen, S., & Herbert, T. B. (1996). Health psychology: Psychological factors and physical disease from the perspective of human psychoneuroimmunology. *Annual Review of Psychology, 47*, 113–142. doi: 10.1146/annurev.psych.47.1.113

Cumming, G., & Finch, S. (2005). Inference by eye: Confidence intervals and how to read pictures of data. *The American Psychologist, 60*, 170–180. doi: 10.1037/0003-066X.60.2.170

Cummins, R. A. (1996). The domains of life satisfaction: An attempt to order chaos. *Social Indicators Research, 38*, 303–332. doi: 10.1007/BF00292050

DeNeve, K. M., & Copper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin, 124*, 197–229. doi: 10.1037/0033-2909.124.2.197

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*, 542–575. doi: 10.1037/0033-2909.95.3.542

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *The American Psychologist, 55*, 34–43. doi: 10.1037/0003-066X.55.1.34

Diener, E. (2012). New findings and future directions for subjective well-being research. *The American Psychologist, 67*, 590–597. doi: 10.1037/a0029541

Diener, E. (2013). The remarkable changes in the science of subjective well-being. *Perspectives on Psychological Science, 8*, 663–666. doi: 10.1177/1745691613507583

Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology, 68*, 653–663. doi: 10.1037/0022-3514.68.4.653

Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology, 54*, 403–425. doi: 10.1146/annurev.psych.54.101601.145056

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125*, 276–302. doi: 10.1037/0033-2909.125.2.276

Fiske, S. T. (1980). Attention and weight in person perception: The impact of negative and extreme behavior. *Journal of Personality and Social Psychology, 38*, 889–906. doi: 10.1037/0022-3514.38.6.889

Frey, B. S., & Stutzer, A. (2002). What can economists learn from happiness research? *Journal of Economic Literature, 40*, 402–435. doi: 10.1111/1468-0297.00570

Gershoff, A. D., Mukherjee, A., & Mukhopadhyay, A. (2007). Few ways to love, but many ways to hate: Attribute ambiguity and the positivity effect in agent evaluation. *Journal of Consumer Research, 33*, 499–505. doi: 10.1086/510223

Heller, D., Watson, D., & Ilies, R. (2004). The role of person versus situation in life satisfaction: A critical examination. *Psychological Bulletin, 130*, 574–600. doi: 10.1037/0033-2909.130.4.574

Ito, T. A., Larsen, J. T., Smith, N. K., & Cacioppo, J. T. (1998). Negative information weighs more heavily on the brain: The negative bias in evaluative categorizations. *Journal of Personality and Social Psychology, 75*, 887–900. doi: 10.1037/0022-3514.75.4.887

Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Sciences of the United States of America, 107*, 16489–16493. doi: 10.1073/pnas.1011492107

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*, 263–292. doi: 10.2307/1914185

Lucas, R. E., & Donnellan, B. M. (2012). Estimating the reliability of single-item life satisfaction measures: Results from four national panel studies. *Social Indicators Research, 105*, 323–331. doi: 10.1007/s11205-011-9783-z

Luhmann, M., Lucas, R. E., Eid, M., & Diener, E. (2012). The prospective effect of life satisfaction on life events. *Social Psychological and Personality Science, 4*, 39–45. doi: 10.1177/1948550612440105

Lyubomirsky, S. (2001). Why are some people happier than others?: The role of cognitive and motivational processes in well-being. *The American Psychologist, 56*, 239–249. doi: 10.1037/0003-066X.56.3.239

Matheson, J. (2011). *Measuring what matters: National statistician's reflections on the National debate on measuring well-being*. London, UK: Office for National Statistics.

Myers, D. G. (1999). Close relationships and quality of life. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 374–391). New York, NY: Russell Sage Foundation.

Oishi, S., Diener, E., Suh, E., & Lucas, R. E. (1999). Value as a moderator in subjective well-being. *Journal of Personality and Social Psychology, 67*, 157–184. doi: 10.1111/1467-6494.00051

Oishi, S., Schimmack, U., & Colcombe, S. J. (2003). The contextual and systematic nature of life satisfaction judgments. *Journal of Experimental Social Psychology, 39*, 232–247. doi: 10.1016/S0022-1031(03)00016-7

Peeters, G., & Czapinski, J. (1990). Positive-negative asymmetry in evaluations: The distinction between affective and informative negativity effects. *European Review of Social Psychology, 1*, 33–60. doi: 10.1080/14792779108401856

Penedo, F., & Dahn, J. (2005). Exercise and well-being: A review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry, 18*, 189–193.

Potter, T., Corneille, O., Ruys, K. I., & Rhodes, G. (2007). "Just another pretty face": A multidimensional scaling approach to face attractiveness and variability. *Psychonomic Bulletin & Review, 14*, 368–372. doi 10.3758/BF03194079.

Pratto, F., & John, O. P. (1991). Automatic vigilance: The attention-grabbing power of negative social information. *Journal of Personality and Social Psychology, 61*, 380–391. doi: 10.1037/0022-3514.61.3.380

Robinson-Riegler, G. L., & Winton, W. M. (1996). The role of conscious recollection in recognition of affective material: Evidence for positive-negative asymmetry. *The Journal of General Psychology, 123*, 93–104. doi: 10.1080/00221309.1996.9921263

Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review, 5*, 296–320. doi: 10.1207/S15327957PSPR0504_2

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*, 141–166. doi: 10.1146/annurev.psych.52.1.141

Schimmack, U. (2009). Measuring wellbeing in the SOEP. *Schmollers Jahrbuch, 129*, 241–249. doi: 10.3790/schm.129.2.241

Schul, Y., & Schiff, M. (1993). Measuring satisfaction with organizations: Predictions from information accessibility. *Public Opinion Quarterly, 57*, 536–551. doi: 10.1086/269394

Schwarz, N., & Strack, F. (1999). Reports of subjective well-being: Judgmental processes and their methodological implications. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 61–84). New York, NY: Russell Sage Foundation.

Schwarz, N., Strack, F., & Mai, H.-P. (1991). Assimilation and contrast effects in part-whole question sequences: A conversational logic analysis. *Public Opinion Quarterly, 55*, 3–23. doi: 10.1086/269239

Sheldon, K. M., Ryan, R., & Reis, H. T. (1996). What makes for a good day? Competence and autonomy in the day and in the person. *Personality and Social Psychology Bulletin, 22*, 1270–1279. doi: 10.1177/01461672962212007

Skowronski, J. J., & Carlston, D. E. (1987). Social judgment and social memory: The role of cue diagnosticity in negativity, positivity, and extremity bias. *Journal of Personality and Social Psychology, 52*, 689–699. doi: 10.1037/0022-3514.52.4.689

Skowronski, J. J., & Carlston, D. E. (1989). Negativity and extremity biases in impression formation: A review of explanations. *Psychological Bulletin, 105*, 131–142. doi: 10.1037/0033-2909.105.1.131

Statistisches Bundesamt (Destatis). (2008). *Datenreport 2008: Ein Sozialbericht für die Bundesrepublik Deutschland* [Data report 2008: Social report for Germany]. Bonn, Germany.

Stiglitz, J. E., Sen, A., & Fitoussi, J.-P. (2009). Report by the commission on the measurement of economic performance and social progress. Retrieved from http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf

Strack, F., Martin, L. L., & Schwarz, N. (1988). Priming and communication: Social determinants of information use in judgments of life satisfaction. *European Journal of Social Psychology, 18*, 429–442. doi: 10.1002/ejsp.2420180505

Stutzer, A., & Frey, B. S. (2008). Stress that doesn't pay: The commuting paradox. *Scandinavian Journal of Economics, 110*, 339–366. doi: 10.1111/j.1467-9442.2008.00542.x

Wagner, G. G., Frick, J. R., & Schupp, J. (2007). The German socio-economic panel study (SOEP) – Scope, evolution and enhancements. *Schmollers Jahrbuch, 127*, 139–169.

Walasek, L., & Stewart, N. (2015). How to make loss aversion disappear and reverse: Tests of the decision by sampling origin of loss aversion. *Journal of Experimental Psychology: General, 144*, 7–11. doi: 10.1037/xge0000039

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. Cambridge, MA: MIT Press.

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6.1.2 Supplementary Studies and Analyses

In Paper 1, I referred to several additional analyses which strengthened the results. These analyses basically a) added control variables (see Section 6.1.2.1) or cross-validated the results b) within independent subsamples (female and male participants, see Section 6.1.2.2) or c) with another wave (2012) of the Socio-Economic Panel (see Section 6.1.2.3). The following paragraphs briefly display results and conclusions of these additional analyses.

6.1.2.1 Control Variables

In survey research on subjective well-being, it is very common to control for demographic and socio-economic variables in order to rule out possible alternative explanations for the results found. As *demographic* control variables, I included age and age-squared (e.g., Blanchflower & Oswald, 2008; Luhmann, Lucas, Eid, & Diener, 2012). As indicators of *socio-economic status*, I controlled for income (logarithm of income to account for the skewed income distribution) and education (years of education). Moreover, I controlled for possible regional differences in satisfaction and took into account whether an individual currently lived in Eastern or Western Germany because individuals usually report higher satisfaction in Western compared to Eastern Germany, both for life in general as well as for all specific domains (Statistisches Bundesamt, 2008).

Tables A1 to A3 present the results of the within-participant, the between-participant, and the longitudinal analyses, including age, age squared, logarithm of income, education, and region as controls. The results remained stable so that with more certainty I can say that the effects are driven by domain negativity and not by systematic differences in demographic and socio-economic variables.

Table A1

Within Approach: Results of Multiple Regression Analysis Predicting Life Satisfaction by Ranked Domain Satisfactions Including Common Demographic and Socio-Economic Variables

	β	**95% CI**
Lowest domain satisfaction	.114**	[.092, .138]
2. lowest domain satisfaction	.082**	[.045, .120]
3. lowest domain satisfaction	.127**	[.084, .167]
4. lowest domain satisfaction	.093**	[.042, .145]
5. lowest domain satisfaction	.094**	[.048, .139]
6. lowest domain satisfaction	.077**	[.027, .127]
7. lowest domain satisfaction	.056*	[.009, .107]
8. lowest domain satisfaction	.052**	[.014, .094]
9. lowest (= highest) domain satisfaction	.049**	[.024, .074]
Age	-.003**	[-.003, -.002]
Age squared	-.001	[-.001, .001]
Logged income	.022	[-.005, .051]
Education	.002	[-.003, .007]
Region	-.095**	[-.122, -.063]

Note. CI = confidence interval. Socio-Economic Panel, data for the year 2013. * $p < .05$. ** $p < .01$.

Table A2

Between Approach: Partial Correlations Between Life Satisfaction and Satisfactions for Least Satisfying and Most Satisfying Domains Including Common Demographic and Socio-Economic Variables (df in parentheses)

	Partial correlations with life satisfaction		
	Minimum	**Maximum**	**Minimum > Maximum**
Health satisfaction	.58*** (6,364)	.44*** (4,825)	✔ ***
Sleep satisfaction	.49*** (5,318)	.43*** (4,938)	✔ ***
Job satisfaction	.58*** (1,753)	.48*** (2,261)	✔ ***
HH role satisfaction	.46*** (3,230)	.45*** (3,215)	✔
HH income satisfaction	.55*** (6,002)	.46*** (4,383)	✔ ***
Income satisfaction	.48*** (6,762)	.47*** (3,200)	✔
Dwelling satisfaction	.51*** (2,385)	.41*** (10,635)	✔ ***
Spare time satisfaction	.53*** (3,492)	.37*** (6,789)	✔ ***
Family life satisfaction	.59*** (1,870)	.43*** (9,375)	✔ ***
Living standard satisfaction	.70*** (2,035)	.48*** (7,201)	✔ ***

Note. HH = household. Correlations are controlled for age, age squared, logged income, education, and region. Socio-Economic Panel, data for the year 2013. *** $p < .001$.

Table A3

Longitudinal Approach: Predicting Life Satisfaction with Positive versus Negative Changes in Domain Satisfactions from a Longitudinal Perspective (b-weights and SE in parentheses)

	DS-	**DS+**	**DS- > DS+**
Δ Health satisfaction	.15 (0.002)***	.05 (0.002)***	✔ ***
Δ Sleep satisfaction	.09 (0.004)***	.03 (0.005)***	✔ ***
Δ Job satisfaction	.04 (0.005)***	.07 (0.004)***	- ***
Δ HH role satisfaction	.11 (0.003)***	.03 (0.004)***	✔ ***
Δ HH income satisfaction	.12 (0.002)***	.06 (0.002)***	✔ ***
Δ Income satisfaction	.07 (0.003)***	.05 (0.003)***	✔ ***
Δ Dwelling satisfaction	.11 (0.002)***	.03 (0.002)***	✔ ***
Δ Spare time satisfaction	.09 (0.002)***	.01 (0.002)***	✔ ***
Δ Family life satisfaction	.15 (0.004)***	.03 (0.005)***	✔ ***

Note. DS = domain satisfaction; HH = household. Control variables used in the analyses included age, age squared, logged income, education, and region. Socio-Economic Panel, data from the 1992 to 2013. *** $p < .001$.

6.1.2.2 Cross-Validation in Independent Subsamples

I also cross-validated the results within two independent subsamples, namely female and male participants (Tables A4 to A6). Both subgroups showed similar results in the within-participant, the between-participant, and the longitudinal approach, indicating that results were stable in different subsamples.

Table A4

Within Approach: Results of Multiple Regression Analysis Predicting Life Satisfaction by Ranked Domain Satisfactions, Separated by Gender

		β	**95% CI**
Male	Lowest domain satisfaction	.133**	[.063, .138]
	2. lowest domain satisfaction	.110**	[.052, .168]
	3. lowest domain satisfaction	.116**	[.046, .181]
	4. lowest domain satisfaction	.084*	[.008, .162]
	5. lowest domain satisfaction	.126*	[.050, .205]
	6. lowest domain satisfaction	.077*	[.005, .146]
	7. lowest domain satisfaction	.011	[-.056, .079]
	8. lowest domain satisfaction	.035	[-.028, .094]
	9. lowest (= highest) domain satisfaction	.075**	[.035, .118]
Female	Lowest domain satisfaction	.109**	[.077, .141]
	2. lowest domain satisfaction	.073*	[.028, .118]
	3. lowest domain satisfaction	.143**	[.085, .208]
	4. lowest domain satisfaction	.094**	[.029, .162]
	5. lowest domain satisfaction	.073*	[.005, .141]
	6. lowest domain satisfaction	.076*	[.011, .142]
	7. lowest domain satisfaction	.082**	[.019, .141]
	8. lowest domain satisfaction	.059*	[.009. .113]
	9. lowest (= highest) domain satisfaction	.037*	[.001, .073]

Note. CI = confidence interval. Socio-Economic Panel, data for the year 2013. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table A5

Between Approach: Correlations Between Life Satisfaction and Satisfactions for Least Satisfying and Most Satisfying Domains, Separated by Gender (N in parentheses)

		Correlations with life satisfaction		
		Minimum	**Maximum**	**Minimum > Maximum**
Male	Health satisfaction	.62*** (3,359)	.44*** (2,633)	✔ ***
	Sleep satisfaction	.53*** (2,581)	.43*** (2,832)	✔ ***
	Job satisfaction	.59*** (1,245)	.51*** (1,584)	✔ ***
	HH role satisfaction	.43*** (1,542)	.45*** (1,658)	-
	HH income satisfaction	.58*** (3,313)	.49*** (2,131)	✔ ***
	Income satisfaction	.54*** (3,305)	.52*** (1,749)	✔
	Spare time satisfaction	.50*** (2,032)	.38*** (3,428)	✔ ***
	Dwelling satisfaction	.51*** (1,309)	.44*** (5,407)	✔ ***
	Family satisfaction	.60*** (978)	.45*** (4,944)	✔ ***
	Living standard satisfaction	.68*** (1,169)	.51*** (3,605)	✔ ***
Female	Health satisfaction	.59*** (3,372)	.48*** (2,552)	✔ ***
	Sleep satisfaction	.52*** (3,016)	.47*** (2,476)	✔
	Job satisfaction	.63*** (634)	.50*** (828)	✔ ***
	HH role satisfaction	.52*** (1,925)	.47*** (1,746)	✔
	HH income satisfaction	.59*** (3,111)	.49*** (2,546)	✔ ***
	Income satisfaction	.49*** (3,901)	.48*** (1,656)	✔
	Spare time satisfaction	.59*** (1,756)	.40*** (3,737)	✔ ***
	Dwelling satisfaction	.56*** (1,267)	.44*** (5,978)	✔ ***
	Family life satisfaction	.64*** (10,287)	.45*** (5,012)	✔ ***
	Living standard satisfaction	.73*** (1,025)	.49*** (4,122)	✔ ***

Note. HH = household. Socio-Economic Panel, data for the year 2013. *** $p < .001$.

Table A6

Longitudinal Approach: Predicting Life Satisfaction with Positive versus Negative Changes in Domain Satisfactions from a Longitudinal Perspective, Separated by Gender (SE in Parentheses)

		DS$^-$	**DS$^+$**	**DS$^-$ > DS$^+$**
Male	Δ Health satisfaction	.15 (0.003)***	.05 (0.003)***	✔ ***
	Δ Sleep satisfaction	.01 (0.006)***	.02 (0.007)***	✔ ***
	Δ Job satisfaction	.04 (0.006)***	.08 (0.005)***	- ***
	Δ HH role satisfaction	.07 (0.004)***	.03 (0.004)***	✔ ***
	Δ HH income satisfaction	.13 (0.003)***	.06 (0.003)***	✔ ***
	Δ Income satisfaction	.01 (0.005)***	.06 (0.004)***	✔ ***
	Δ Dwelling satisfaction	.11 (0.004)***	.02 (0.003)***	✔ ***
	Δ Spare time satisfaction	.09 (0.003)***	.01 (0.003)***	✔ *
	Δ Family life satisfaction	.13 (0.007)***	.03 (0.007)***	✔ ***
Female	Δ Health satisfaction	.14 (0.003)***	.05 (0.003)***	✔ ***
	Δ Sleep satisfaction	.08 (0.006)***	.03 (0.006)***	✔ ***
	Δ Job satisfaction	.05 (0.008)***	.07 (0.007)***	-
	Δ HH role satisfaction	.11 (0.003)***	.03 (0.004)***	✔ ***
	Δ HH income satisfaction	.12 (0.003)***	.06 (0.003)***	✔ ***
	Δ Income satisfaction	.06 (0.004)***	.05 (0.004)***	✔
	Δ Dwelling satisfaction	.10 (0.003)***	.03 (0.003)***	✔ ***
	Δ Spare time satisfaction	.09 (0.003)***	.02 (0.003)***	✔ ***
	Δ Family satisfaction	.17 (0.006)***	.03 (0.006)***	✔ ***

Note. DS = domain satisfaction; HH = household. Socio-Economic Panel, data from 1992 to 2013. * $p < .05$. *** $p < .001$.

6.1.2.3 Cross-Validation in 2012

Last, but not least, results were cross-validated with Socio-Economic Panel data from the year 2012 (see Tables A7 to A8). A cross-validation with a different wave can only be applied to the between-participant and the within-participant approach, and not to the longitudinal approach in which - per definition - necessarily all waves were considered simultaneously. Please note that in 2012, satisfaction with social security was assessed instead of satisfaction with living standard.

Table A7

Within Approach: Results of Multiple Regression Analysis Predicting Life Satisfaction by Ranked Domain Satisfactions in 2012

	B	**95% CI**
Lowest domain satisfaction	.114***	[.093, .138]
2. lowest domain satisfaction	.082***	[.053, .122]
3. lowest domain satisfaction	.126***	[.091, .175]
4. lowest domain satisfaction	.093***	[.046, .141]
5. lowest domain satisfaction	.093***	[.044, .144]
6. lowest domain satisfaction	.076***	[.025, .122]
7. lowest domain satisfaction	.055 **	[.011, .094]
8. lowest domain satisfaction	.052 **	[.012, .085]
9. lowest (= highest) domain satisfaction	.049***	[.028, .080]

Note. CI = confidence interval. Socio-Economic Panel, data for the year 2012. ** $p < .01$. *** $p < .001$.

Table A8

Between Approach: Correlations Between Life Satisfaction and Satisfaction for Least Satisfying and Most Satisfying Domains in 2012 (N in parentheses)

	Correlation with life satisfaction		
	Minimum	**Maximum**	**Minimum > Maximum**
Health satisfaction	.61*** (1,037)	.51*** (1,712)	✔ ***
Sleep satisfaction	.51*** (1,337)	.47*** (1,985)	✔
Job satisfaction	.38*** (657)	.52*** (1,120)	- ***
HH role satisfaction	.38*** (959)	.53*** (1,215)	- ***
HH income satisfaction	.56*** (1,190)	.56*** (1,393)	-
Income satisfaction	.55*** (1,472)	.57*** (1,409)	-
Dwelling satisfaction	.52*** (536)	.50*** (3,194)	✔
Spare time satisfaction	.57*** (1,660)	.52*** (1,442)	✔ *
Family life satisfaction	.58*** (565)	.47*** (3,456)	✔ ***
Social security satisfaction	.46*** (2,527)	.57*** (769)	- ***

Note. HH = household. Socio-Economic Panel, data for the year 2012. *** $p < .001$.

6.2 Paper #2: Judgmental Processes Underlying Reports of Life Satisfaction

Experimental Evidence on the Relation Between Specific Domain Satisfactions and Overall Life Satisfaction: Why Negative Domains Exert a Particular Influence

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Abstract

Based on judgmental models of subjective well-being the present research aimed at the underlying mechanism of domain negativity in the relationship between health satisfaction and overall life satisfaction. In a self-generated online-survey temporary accessibility of health-related information was systematically manipulated by varying the question order in which the two satisfaction items (health and overall) were assessed in both healthy and unhealthy individuals. Results showed that the correlation between health satisfaction and life satisfaction was more pronounced for participants who reported poor health compared to participants who reported good health, but only when health information was not made accessible by a prior question. When health information was made accessible by a preceding question, individuals' health satisfaction and their overall life satisfaction were about equally correlated in healthy and unhealthy individuals. Generally, results indicate that due to increases in accessibility negative domains can contribute more than positive domains to overall evaluations of one's own life.

Keywords: accessibility, life satisfaction, domain satisfaction

Experimental Evidence on the Relation Between Specific Domain Satisfactions and Overall Life Satisfaction: Why Negative Domains Exert a Particular Influence

Individuals have always tended to evaluate other individuals, things, events, their past, their future, and indeed themselves and their own life. Among this list, the evaluation of one's life is of particular importance as it reflects, in a broad sense, the status of the organism, and is linked to many psychological as well as physiological consequences (see Diener, 1984; Diener, 2000; Frey & Stutzer, 2002; Lyubomirsky, 2001; Ryan & Deci, 2001, for overviews). With respect to individuals' evaluation of their life, the concepts of subjective well-being, life satisfaction, and happiness are often used interchangeably. Subjective well-being represents people's evaluations of their life - both in terms of cognitions and feelings (Diener, 2012). Life satisfaction refers to the cognitive component of subjective well-being (Andrews & Withey, 1974). Other facets of well-being, such as the presence of positive affect and the lack of negative affect, refer to the affective component of subjective well-being (see e.g., Diener, 1984). Although the components of subjective well-being are correlated, researchers have found that these components have different relationships with other variables, both in terms of causes (Schimmack, Schupp, & Wagner, 2008) and consequences (Wiest, Schüz, Webster, & Wurm, 2011). In acknowledging these potential differences, the present research focused primarily on the cognitive component of subjective well-being, that is, on how satisfied individuals are with their life in general (particularly because the present research builds on prior work that has emphasized the cognitive component, see Engel & Bless, 2017).

At least two distinct lines of research that address individuals' evaluation of their life can be distinguished. On the one hand, researchers have investigated variables that are associated with individuals being rather satisfied or dissatisfied with their life, on the other hand, research

has addressed *how* individuals form satisfaction judgments (e.g., Schwarz & Strack, 1999) in order to understand how individuals retrieve judgment-relevant information, and how this information is integrated into a judgment of overall life satisfaction.

Focusing on the process aspect, the present paper addresses how individuals' overall life satisfaction reflects their satisfaction with specific domains of their life (e.g., satisfaction with their financial situation, with their family situation, etc.). Building on prior research (Engel & Bless, 2017), it is assumed that domains with which individuals are less satisfied exert a particular influence on overall life satisfaction (relative to domains that individuals are very satisfied with). In the subsequent sections, I outline that the formation of satisfaction judgments depends, to a large degree, on which information is accessible at the time the judgment is formed, and that negative information is often more accessible than positive information. Based on this theorizing, this experimental study investigates the relation between satisfaction with one's health and overall life satisfaction, thereby focusing on the role of accessibility and on the role of negative (vs. positive) information. The subsequent sections address these aspects in turn.

Judgmental Processes and the Role of Accessibility

Life satisfaction judgments, like other complex cognitive judgments, are not as simple as they might appear at first sight, but require rather multiplex cognitive processes. For example, when individuals are asked to evaluate their life, they could start searching for information, decide which information might be relevant for the judgment, weigh this information, and eventually relate this information with the past, or with one's own future expectations, and so forth. In their judgmental model of life satisfaction, Schwarz and Strack (1999) argued that, theoretically, individuals could consider all information that might be relevant for their overall judgment and engage in elaborated computation processes. However, according to the theorem,

individuals either lack motivation or capacity, or both, to do so. When answering the question *"How satisfied are you with your life?"*, individuals normally provide fast answers based on a subset of information, namely the accessible information. According to the judgmental model of life satisfaction this is because individuals *truncate* their search process for judgment-relevant information as soon as they assume they have a sufficient basis for making the judgment. Due to this truncation of search for information, the accessible information is more likely to influence the satisfaction rating than other information, which does not easily come to mind. Accessible information, therefore, has a large impact on life satisfaction judgments.

Temporary and chronic accessibility. The judgmental model of life satisfaction distinguishes between two important types of accessibility: *temporary* and *chronic* accessibility (Schwarz & Strack, 1999). *Temporarily accessible* information is defined as information that is accessible due to certain characteristics of the *situation*. Information is accessible because it has been *recently* activated, for example, through the construction of the survey. And indeed, recent events and recently activated information have been shown to influence life satisfaction judgments in particular. For example, recent, rather than distal, life events particularly matter when forming life satisfaction judgments (Suh, Diener, & Fujita, 1996). Not only do recent life events influence life satisfaction judgments, but also recent aspects of the survey, for example, preceding questions or the introduction of the survey itself, may have an impact. In this respect, Strack, Martin, and Schwarz (1988) studied the influence of *preceding questions* on life satisfaction judgments. In their study, the researchers assessed students' life satisfaction and their dating frequency while systematically varying the order in which the questions were assessed. The correlation between dating frequency and life satisfaction increased significantly when the dating frequency question was asked first (r = .66) versus when the life satisfaction question was

asked first (r = -.12). This reflected that the use of dating frequency may or may not be considered as an important component when forming a life satisfaction judgment, depending on the order in which the two variables are asked. Generally, question order effects are particularly interesting because their potential biases may appear in *any* survey with more than one question.[1] Apart from the effect of the question order, the *introduction of the survey* also may have an impact on life satisfaction judgments. Smith, Schwarz, Roberts, and Ubel (2006) examined the correlation between health satisfaction and overall life satisfaction. They systematically varied the survey introduction as well as the question order. Parkinson's disease patients were called either for a medical study by a medical center or for a regional study by a local university. Health satisfaction correlated higher with life satisfaction when the survey context was related to health (medical study context) rather than in the neutral context of the survey (regional study context). [2] Thus, answers to questions about life satisfaction seem to be sensitive to the context in which the questions are asked.[3]

In addition to the impact of temporarily accessible information, life satisfaction judgments can also be influenced by *chronically* accessible information. Chronically accessible information is rather independent of the situation and describes information that comes to mind easily because it has been used *frequently*. For instance, information may be used frequently because it is closely related to a person's life goals, concerns, needs, or values. In this respect Oishi, Diener, Suh, and Lucas (1999) showed that life satisfaction judgments heavily relied on

[1] Despite evidence for question order effects, I also would like to mention research that was either not able to demonstrate question order effects at all or demonstrated only very weak effects (in a meta-analysis as well as in a replication of the original study by Strack et al., 1988; see Schimmack & Oishi, 2005).

[2] This effect only held in the question order where life satisfaction was asked first. When health satisfaction was asked first, the overall correlation of health and life satisfaction was independent of the introduction of the survey.

[3] Please note that the study by Smith et al. (2006) did not examine the effect of the introduction of the survey in healthy individuals, but only in Parkinson's disease patients. The present research distinguishes between the effects of activating health-related information in healthy versus unhealthy individuals; also see below.

information that was closely related to one's values. For example, life satisfaction was more strongly correlated with daily achievement satisfaction among students who were high rather than low in achievement values. For more examples, see the value-as-a-moderator model (Oishi et al., 1999). Another study by Oishi, Schimmack, and Colcombe (2003) also demonstrated the influence of chronically accessible information on life satisfaction. In their study, high sensation seekers (assuming them to be chronically high in excitement) based their life satisfaction judgments more on the frequency of excitement compared to low sensation seekers (assuming them to be chronically low in excitement).

To sum up, ample evidence has demonstrated the influence of either temporarily *or* chronically accessible information on life satisfaction judgments. Presumably, life satisfaction judgments can and are most likely to be influenced by both temporarily *and* chronically accessible information. There is still some disagreement about the relative influence of temporary versus chronic accessibility. Whereas some researchers have emphasized the strong and important influence of contextual variables and temporarily accessible information (Schwarz & Strack, 1999), others have argued that life satisfaction is rather independent of the context and is primarily influenced by chronically accessible information (Schimmack et al., 2002; Schimmack & Oishi, 2005). Within this discussion, it seems an important question regarding what causes an increased (temporary or chronic) accessibility. In the next section, it is proposed that negativity of information is one crucial factor in this respect.

The Particular Role of Negative Information

Negativity bias describes the tendency of negative information to exert a stronger impact on individuals compared to positive information. The stronger impact of the negative has been demonstrated in many different areas - from basic physiological processes to more complex

cognitive processes, including, among others, research on attention, memory, and decision making, as well as reports of life satisfaction (see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001, for reviews).

The stronger impact of negative information is also captured in prospect theory, which assumes that losses loom larger than gains (Kahneman & Tversky, 1979). For example, individuals reported more distress when losing some money, whereas gaining the same amount of money did not create as much happiness (Kahneman & Tversky, 1984). Consistent findings have been observed with respect to individuals' reports of their life satisfaction. For example, Boyce, Wood, Banks, Clark, and Brown (2013) found that income losses had a larger effect on subjective well-being than income gains. Relatedly, adaptation to positive events (e.g., marriage) seems to occur faster than adaptation to negative events (e.g., divorce; Lucas, Clark, Georgellis, & Diener, 2003). Furthermore, individuals who became unemployed rarely completely adapted and reported permanent changes in life satisfaction (Lucas, Clark, Georgellis, & Diener, 2004). Thus, adaptation to positive events seems to be faster and more complete than adaptation to negative life events.

With respect to information processing, it is assumed that negative and positive information is distributed asymmetrically along the positive-negative dimension, and that positive information is usually more densely located than negative information (Alves, Koch, & Unkelbach, 2017). One consequence of this asymmetry is that negative information attracts more attention than positive information (Ito, Larsen, Smith, & Cacioppo, 1998; Pratto & John, 1991). This increased attention, in turn, leads to better memory for negative rather than for positive information (Robinson-Riegler & Winton, 1996).

Negativity and the Relation Between Domain and Overall Life Satisfaction

Combining the above considerations on accessibility and on negativity results in the hypothesis that negative aspects contribute more than positive aspects to overall evaluations and that this relation is, in part, due to the increased accessibility of the negative information. Direct evidence for the higher accessibility of negative information is provided by Schul and Schiff (1993). They investigated customers' satisfaction with a telecom company and asked customers about their general satisfaction with the company and about their satisfaction with specific aspects of the service provided (e.g., repair service, accuracy of the telephone bill, or line quality). The authors identified the four least satisfactory and the four most satisfactory domains. The correlation between overall satisfaction and the four least satisfactory domains was $r = .55$, but only $r = .37$ for the four most satisfactory domains when the general question preceded the specific domain questions. Schul and Schiff (1993) explained this pattern with the increased accessibility of negative experiences. Specifically, they proposed that negative experiences are often associated with a hindering of goal-directed activities about which individuals tend to ruminate - which, in turn, increases the accessibility of these experiences.

Engel and Bless (2017) related these considerations to individuals' evaluations of their life. In three different studies using large and nationally representative data, the authors systematically examined the association between individuals' overall life satisfaction and their satisfaction with specific domains (e.g., financial situation, family, etc.). The results clearly indicated that correlations between overall life satisfaction and satisfaction with specific domains were reliably higher for the least satisfying domain in comparison the most satisfying domain, independent of which specific domain was the lowest or the highest within individuals. Moreover, the correlation between a specific domain satisfaction and life satisfaction was

significantly higher when comparing individuals being least versus individuals being most satisfied with the respective domain. Finally, emphasizing changes over time in domain satisfactions, decreases in a specific domain satisfaction had a larger impact on life satisfaction than increases in the respective domain.

Importantly, the findings reported by Engel and Bless (2017) do not allow for a direct answer whether, as assumed, the observed findings are indeed due to the increased accessibility, or whether other mechanisms are responsible for the observed pattern (see Engel & Bless, 2017, for a discussion). One possibility to approach this question can be found in the above discussed research by Schul and Schiff (1993). The authors reported that the differential impact between the least and the most satisfactory domains was reduced when the specific questions preceded the general question. Apparently, the accessibility differences of the different domains were reduced by the fact that participants had to think about the specific aspects in the specific-general question order. Accordingly, the assumed crucial role of accessibility in the research by Engel and Bless (2017) would be supported if the obtained differential correlation between positive versus negative specific domains and the overall satisfaction judgment is reduced when the specific domains are made accessible prior to the formation of the overall judgment.

Life Satisfaction, Health Satisfaction, and Health Status

To address the relationship between life satisfaction and domain satisfactions, the present research investigates the relation between individuals' satisfaction with their health (specific domain) and their overall life satisfaction. I chose the health domain because, on the one hand, it is obvious that health is a potentially relevant domain for all participants (see e.g., Argyle, 2001), whereas on the other hand, health is presumably not chronically accessible for all individuals (if this were the case, experimental manipulations of accessibility would exert no effect, see Bless &

Schwarz, 2010). Rather, I assume that one's own health is often habitually taken for granted and that health more frequently comes to individuals' mind when they are unhealthy rather than when they are healthy.

Supporting these considerations, individuals' health satisfaction correlates at a medium level with overall life satisfaction (r = .35, see Heller, Watson, & Ilies, 2004, for an overview). Comparable to health satisfaction, *health status* is also positively related to overall life satisfaction and has been studied since the beginning of subjective well-being research (see e.g., Andrews & Withey, 1974; Campbell, Converse, & Rodgers, 1976). Correlational research found that a good health status is associated with higher life satisfaction, whereas a lower health status is linked to lower life satisfaction (Campbell et al., 1976). Okun, Stock, Haring, and Witten (1984), for example, demonstrated in their meta-analysis that life satisfaction and health status correlated at r = .32. Thus, both health satisfaction and health status are potentially relevant for all participants. Moreover, health is particularly important for older individuals, where health often comes out as one of the main predictors for their subjective well-being (Argyle, 2001; Campbell et al., 1976). Assuming that older individuals usually have poorer health, this finding fits with the present assumption that negative domains exert a particular influence on overall life satisfaction and gives first evidence that health might be more strongly considered by some individuals than by others.

An Experimental Test of Accessibility as the Underlying Mechanism of Negativity Bias in Life Satisfaction Judgments

In the present study, I investigated the role of accessibility in the health satisfaction-life satisfaction relationship. Using a self-generated online-survey, I manipulated the temporary accessibility of health-related information by systematically varying the question order in which

the two satisfaction items (general and health) were assessed. I predicted that the negativity effect would be reflected in a higher correlation between health satisfaction and overall life satisfaction for individuals who describe their health status as rather unhealthy. Importantly, this pattern should be most pronounced when overall life satisfaction is assessed prior to any mentioning of the health domain. However, when a prior question about health renders health-related information accessible, no differential accessibility of satisfaction with health is expected. Accordingly, the difference in the correlation between health satisfaction and life satisfaction between healthy and unhealthy individuals should, therefore, be reduced.

Method

Participants. I recruited participants from *Amazon Mechanical Turk* (*MTurk*), an online subject pool by Amazon.com. These subjects are demographically diverse and the data from studies run online using *MTurk* produces similar results to those run in a laboratory (see e.g., Buhrmeister, Kwang, & Gosling, 2011, see also Stewart et al., 2015; Zhou, & Fishbach, 2016, for more critical evaluations of *MTurk*). My sample (N = 248) had a mean age of 36.53 years (SD = 12.37) and gender was approximately equally distributed (male: 47%, female: 53%).

Procedure and Design. To manipulate health accessibility experimentally, I relied on a simple question order paradigm. Individuals were randomly assigned to rate their overall life satisfaction either before or after they rated their satisfaction with health. Positive versus negative health status was measured (see below). In addition, basic background information (age, gender, education, income) was assessed. Participants were provided with a small payment ($0.20) for their participation.

Note that the full design of my study also included a semantic priming procedure where individuals either saw health-related pictures or neutral pictures before the assessment of the

satisfaction variables. Here, I only report the results of the neutral priming condition because the priming manipulation was not successful; complete results can be found in the Appendix of this paper.

Measurements. My core variables overall life satisfaction ("*How satisfied are you with your life, all things considered?*") and health satisfaction ("*How satisfied are you with your health?*") were assessed with single items on a five-point rating scale (ranging from 0 = *completely dissatisfied* to 4 = *completely satisfied*). I used a single item to measure life satisfaction to make the assessment of life satisfaction as much comparable as possible to the assessment of life satisfaction in most representative surveys (e.g., the Socio-Economic Panel, SOEP; Wagner, Frick, & Schupp, 2007). Despite single item measurement, reliability of life satisfaction is usually very high (retest reliability of .60 in four nationally representative studies, including the SOEP; Lucas & Donnellan, 2012).

Self-rated health status ("*How would you describe your current health?*") was assessed on a five-point rating scale (ranging from 1 = *good* to 5 = *bad*). I classified individuals with values ranging from 1 to 2 as poor health status individuals and individuals with values ranging from 4 to 5 as good health status individuals. In all, 45% rated their health as rather poor or poor (N = 112) and 41% as rather good or good (N = 102). Individuals who rated their health status as neither good nor bad were not considered in my analysis (N = 34). The reduced sample thus considered N = 214 individuals. Age, gender, education in years and household income were also assessed to control for potential influences of these variables on life satisfaction, health satisfaction, as well as on health status.

Results and Discussion

Overall, individuals were rather satisfied with their life (M = 3.18, SD = 1.24) as well as with their health (M = 2.88, SD = 1.48). Self-reported health status and satisfaction with health correlated substantially (r = .88, p < .01). Not surprisingly, health satisfaction was significantly lower in individuals who rated their health as poor (M = 1.63, SD = 0.73) in comparison to those individuals who rated their health as good (M = 4.25, SD = 0.62), $t(212) = -27.97$, $p < .001$. A similar pattern emerged for life satisfaction, where individuals with poor health were less satisfied with their life (M = 2.49, SD = 1.13) compared to individuals with good health (M = 3.93, SD = 0.85), $t(204) = -10.60$, $p < .001$.[4]

Partial correlations for the four different experimental conditions are provided in Table 1. In the condition where I did not activate health-related information via a prior health-related question (LS-DS condition), I found a significantly higher partial correlation of health satisfaction and life satisfaction for individuals with rather poor self-rated health (r = .55, p = .002, N = 49) compared to individuals with rather good self-rated health (r = .16, p = .303, N = 46); z = 2.11, p = .018, one-tailed. When health-related information was rendered accessible through a prior question (DS-LS condition) I did not find a difference between healthy and unhealthy individuals in their health satisfaction-life satisfaction relationship (r = .42, p = .001, N = 63 for individuals with rather poor self-rated health vs. r = .44, p = .001, N = 56 for individuals with rather good self-rated health). The difference of .02 was not significant, z = -0.12, p = .453, one-tailed.

[4] Please note that differences in degrees of freedom for corresponding t-tests were not due to different Ns. Due to unequal variances in life satisfaction, I reported a Welsh-corrected t-test, leading to reduced degrees of freedom.

For healthy individuals, I found a higher partial correlation between health satisfaction and life satisfaction when health was activated through a prior health-related question (r = .44, p = .001, N = 56) compared to the condition where the general satisfaction question was assessed first (r = .16, p = .303, N = 46). The increase in the partial correlation was marginally significant, z = 1.49, p = .068, one tailed. The relationship between health satisfaction and life satisfaction in unhealthy individuals did not differ significantly depending on the order in which the two satisfaction items were assessed (LS-DS: r = .55, p = .002, N = 49 vs. DS-LS: r = .42, p = .001, N = 63); z = 0.83, p = .204, one-tailed.

Table 1

Partial Correlations Between Health Satisfaction and Life Satisfaction by Question Order and Health Status (N in Parentheses)

	LS-DS	**DS-LS**
Health status: poor	.55** (49)	.42** (63)
Health status: good	.16 (46)	.44** (56)

Notes. LS = life satisfaction; DS = domain satisfaction. Controlled for age, age-squared, education in years, and logarithm of household income. ** p < .01.

General Discussion

The current research addresses the relationship between health satisfaction and life satisfaction in general, and the role of accessibility and negativity in particular. The obtained findings match with the outlined hypotheses: The correlation between health satisfaction and life satisfaction was more pronounced for participants who reported poor health compared to participants who reported good health, but only when health information was not made accessible by a prior question. When health information was made accessible by a preceding

question, individuals' health satisfaction and their overall life satisfaction were about equally correlated.

The differential correlation obtained for individuals reporting poor versus good health when no health information was activated prior to the overall satisfaction judgment conceptually replicates the findings reported by Engel and Bless (2017) demonstrating that higher domain-overall correlations for those domains individuals were least (relative to most) satisfied with. Departing from Engel and Bless (2017), the present approach did not rely on domain satisfaction judgments to determine negativity, but used self-reported health status as another indicator for negativity. In order to allow for even more direct comparisons, I re-analyzed the findings reported by Engel and Bless (2017) with respect to the relation between satisfaction with health and overall life satisfaction. Specifically, I replaced *least/ most satisfied* domain as the variable representing domain negativity with self-reported health status (this approach is described in more detail in the Appendix). Most importantly, the results found in nationally representative data strongly converge with the findings reported above.

Going beyond Engel and Bless (2017), the present experiment aimed at the underlying mechanism of domain negativity. Specifically asking the health question prior to the overall satisfaction question eliminated the different correlations obtained for healthy versus unhealthy participants. Presumably, this question order increased the accessibility of the health domain for all participants independent of their health status, and thus eliminated the retrieval advantage of negative information. These findings are in line with the judgmental model offered by Schwarz and Strack (1999), who argued that judgments of life satisfaction are determined by either chronic or temporary accessibility of judgment-relevant information (see Oishi et al., 1999, for further empirical evidence). Moreover, the present findings fit nicely with the conclusion offered

by Schul and Schiff (1993). Their research indicated that due to increases in accessibility, negative aspects contribute more than positive aspects to overall evaluations.

More generally, the present findings also contribute further empirical evidence to the negativity bias, which has been demonstrated in diverse areas (Ito et al., 1998; Kahneman & Tversky, 1979; Pratto & John, 1991; see Baumeister et al., 2001; Rozin & Royzman, 2001, for overviews), as well as in life satisfaction research (Boyce, Wood, Banks, Clark, & Brown, 2013; Kahneman & Deaton, 2010; Lucas et al., 2003). Several explanations for the negativity bias have been offered that focus on various memory and judgmental processes (see Alves et al., 2017). The present study particularly emphasizes the notion that the negativity bias may, in part, result from the increased accessibility of negative information.

Note that by relying on the experimental approach (manipulating accessibility by question order), it was aimed to complement the prior findings that relied on large and representative survey data (Engel & Bless, 2017). Whereas using representative data reduces the risk that effects only occur (or do not occur) due to specific characteristics of the respective sample (e.g., female young psychology students; Henrich, Heine, & Norenzayan, 2010), at the same time, this strategy comes along with almost inevitable disadvantages of correlational and secondary data (no causal inference, no manipulation of variables of interest). Combining different methods, namely experimental methods and representative data, can lead to added value and can contribute to deeper insights.

Limitations

One might argue that self-reported health status is a subjective measure of health that does not fully reflect individuals' actual health. Admittedly, this might be true, and future research could aim to address this issue. Note, however, that the present approach holds that it is

the individuals' perspective on a specific domain (here health) that influences accessibility and, in turn, the influence on overall life satisfaction. In line with this assumption, research has shown that subjective measures of health are more strongly related to, and, therefore, in a way more relevant for, life satisfaction (Diener, Suh, Lucas, & Smith, 1999).

Outlook

One avenue for future research could aim toward investigating situational conditions that increase the accessibility of specific domains independent of the question order paradigm that was used here, and that is typically used in related research (see Schwarz & Strack, 1999). Leaving the laboratory, it would be interesting to learn about which cues in individuals' environment trigger the accessibility of particular domains and, in turn, their influence on overall life satisfaction. The additional procedure and results reported in the Appendix was originally designed as a first step in this direction. Specifically, it was attempted to prime the health domain by presenting buildings of famous U.S. hospitals (e.g., Mayo Clinic). Unfortunately, this priming procedure did not (only) activate the health domain, but also a diverse set of additional information (see also the follow-up study reported in the Appendix).

The present approach focused on the role of accessibility to explain negativity effects. While examining this potential explanation, I readily admit that the often observed negativity bias (see Baumeister et al., 2001; Rozin & Royzman, 2001) is not caused only by differences in accessibility (Alves et al., 2017). Thus, it seems an important endeavor to investigate other possible mechanisms (e.g., judgmental processes, diagnosticity of negative information), and eventually test competing mechanisms in relation to each other.

Appendix

The following paragraphs display three additional studies, completing the presented research in the main body. In the first additional study, I validated the negativity effect found in the experimental design in nationally representative data. In the second study, I present the full experimental design, which includes an additional health prime condition. The third study refers to a supplementary qualitative approach specifically examining the health primes I used.

Study 1: Negativity Bias in Life Satisfaction Judgments

In Study 1, I examined the relationship between health satisfaction and life satisfaction in a nationally representative sample of the German population. I particularly focused on the influence of *negativity* on the relationship between health satisfaction and life satisfaction. I expected the correlation between health satisfaction and life satisfaction to be significantly higher in individuals with poor self-rated health compared to the correlation for individuals with good self-rated health.

Method

Data and participants. I used nationally representative data from the SOEP, year 2013 (Wagner et al., 2007). The SOEP assesses a broad range of variables - occupation, employment, earnings, demographic variables, and of particular interest for my research, health-related variables and satisfaction measures. For the analyses, I examined, in total, N = 23,288 individuals who provided answers for life satisfaction, health satisfaction, and self-rated health status. As expected in a representative sample of the German population, gender was nearly equally distributed (49% male, 51% female) and mean age was 50.52 years (SD = 18.25).

Measurements. The core variables were life satisfaction ("*How satisfied are you with your life, all things considered?*") and health satisfaction ("*How satisfied are you with your*

health?"). Both satisfaction variables were assessed with single items on an eleven-point rating scale (ranging from 0 = *completely dissatisfied* to 10 = *completely satisfied*). The SOEP first assesses a wide range of domain satisfactions at the very beginning of the survey and overall life satisfaction at the end of the survey. Nearly 150 different questions are asked in between, rendering question order effects (as described in the main body) very unlikely.

Self-rated health status ("*How would you describe your current health?*") was assessed on a five-point rating scale (ranging from 1 = *good* to 5 = *bad*). I classified individuals with values ranging from 1 to 2 as poor health status individuals (N = 4,489) and individuals with values ranging from 4 to 5 as good health status individuals (N = 11,344). Individuals who rated their health status as neither good nor bad were not considered in my analyses (N = 7,455).

Analyses. For the main analyses, I compared the partial correlations of health satisfaction with life satisfaction for unhealthy and healthy individuals. To test whether the partial correlations differed significantly, I transformed correlation coefficients to Fisher's z scores and compared z values.

Results and Discussion

Overall life satisfaction (M = 7.22, SD = 1.71) and satisfaction with health (M = 6.73, SD = 2.17) were both relatively high in my sample. As expected, satisfaction with health was significantly lower in unhealthy individuals (M = 3.64, SD = 1.98) in comparison to healthy individuals (M = 8.18, SD = 1.33), $t(15{,}831) = -141.49$, $p < .001$. Moreover, unhealthy individuals rated their overall life satisfaction significantly lower (M = 5.81, SD = 2.13) than did healthy individuals (M = 7.81, SD = 1.42), $t(15{,}831) = -58.05$, $p < .001$.

When I controlled socio-economic status and demographic variables for the relationship between life satisfaction and health satisfaction, I found the following partial correlations: for

unhealthy individuals $r = .35$ ($p < .001$, $N = 4{,}141$) and for healthy individuals $r = .28$ ($p < .001$, $N = 9{,}943$), which differed significantly, $z = 4.39$, $p < .001$, one-tailed. Please note that N was reduced due to the fact that more variables, namely the control variables, entered into the partial correlation. Only participants with no missing values in any of the considered variables remained in this analysis.

Results supported the hypothesis that holds that when health is subjectively rated as low, association to life satisfaction is higher in comparison to when health is rated as good. All things considered, Study 1 clearly demonstrates a difference in the considered health satisfaction-life satisfaction relationship.

Study 2: Environmental Cues as Primes for Temporary Accessibility of Health

Preceding questions can influence answers in a survey, as demonstrated by Schwarz, Strack, and Mai (1991; see Schwarz & Strack, 1991, for an overview). The present study extends this theoretical rationale to environmental cues. On a theoretical level, *priming health-related cues* or *asking self-related health questions* are very similar. Practically, question order effects, indeed, have more implications for survey methodology and survey design because those effects may appear in every survey with more than one question. Still, trying to extent psychological findings to a broader and more environmental perspective seems to be an interesting way to generalize conclusions and widen theories.

In the current study, I primed individuals either with pictures of famous and well-known hospitals or pictures of neutral buildings. The following sections describe method and results of the health-related environmental cue condition. A detailed discussion of results in the neutral picture condition in this study can be found in the main body. In the health prime condition, I assumed that by priming health-related environmental cues, the accessibility of health-related

information increases, and, thus, has a stronger influence on the overall life satisfaction judgment. This effect should parallel question order effects in the way that the correlation of health satisfaction and life satisfaction increases when individuals see hospital primes rather than neutral primes. Importantly, this priming effect should be stronger when health is not chronically accessible, namely in healthy individuals.

Method

Participants. The total sample (N = 473) recruited from *Mechanical Turk* had a mean age of 36.75 years (SD = 12.45) and gender was approximately equally distributed (46% male, 54% female). In all, 213 participants rated their health status as poor (45%) and 193 as good (41%). Also, 67 participants were not considered in my further analyses because they rated their health status as neither good nor bad (14%). Those 67 participants were not considered in the following analyses, focusing only on individuals with good or with poor health status, N = 406.

Design and measures. Individuals were randomly assigned to a health prime condition or a neutral prime condition. In the *health prime condition*, individuals saw four pictures of famous hospitals in the U.S. and their respective names, and in the *control condition*, individuals were exposed to pictures of famous music halls and their respective names. Both conditions showed some filler items (six pictures of famous buildings in the U.S. and their respective names). For the measurement of life satisfaction, health satisfaction, and health status, as well as for the classification of poor versus good health, see main study.

Analyses. As in the main study, I compared the partial correlations between health satisfaction and life satisfaction by transforming them into Fisher's z scores and controlled for the abovementioned demographic and socio-economic variables.

Results

Results in the priming condition were mixed (see Table A1). I was able to show the expected priming effect for individuals with good health status in the general-specific question order condition (r = .49, p < .001, N = 51 vs. r = .16, p = .303, N = 46; z = 1.76, p = .039, one-tailed) but not in the specific-general question order condition (r = .56, p < .001, N = 40 vs. r = .44, p = .001, N = 56; z = 1.43, p = .439, one-tailed). I was also not able to show a priming effect in any of the question order conditions for unhealthy individuals (LS-DS: r = .36, p = .008, N = 56 vs. r = .55, p = .002, N = 49; z = 1.15, p = .125, one-tailed; DS-LS: r = .34, p = .029, N = 45 vs. r = .42, p = .001, N = 63; z = -0.47, p = .321, one-tailed).

The expected question order effect did not emerge for healthy individuals in the health priming condition (r = .49, p < .001, N = 51 vs. r = .56, p < .001, N = 40; z = -0.44, p = .329, one-tailed) and was marginally significant in the neutral priming condition (r = .16, p = .303, N = 46 vs. r = .44, p = .001, N = 56; z = -1.52, p = .065, one-tailed), and did also not emerge for unhealthy individuals in neither of the two priming conditions (health prime: r = .36, p = .008, N = 56 vs. r = .34, p = .029, N = 45; z = 0.11, p = .456, one-tailed; neutral prime: r = .55, p = .002, N = 49 vs. r = .42, p = .001, N = 63; z = 0.87, p = .192, one-tailed).

Table A1

Partial Correlations Between Health Satisfaction and Life Satisfaction by Prime, Question Order, and Health Status (N in Parentheses)

	Health prime		**Neutral prime**	
	LS-DS	**DS-LS**	**LS-DS**	**DS-LS**
Health status: poor	.36** (56)	.34* (45)	.55** (49)	.42** (63)
Health status: good	.49*** (51)	.56*** (40)	.16 (46)	.44** (56)

Notes. LS = life satisfaction; DS = domain satisfaction. Controlled for age, age-squared, education in years, and logarithm of household income. * $p < .05$. ** $p < .01$. *** $p < .001$.

Discussion

In conclusion, the present findings support my hypothesis that the association between health satisfaction and life satisfaction is higher when healthy (but not unhealthy) individuals see health-related compared to neutral cues (in the LS-DS condition), thus environmental cues may have an influence on the health satisfaction-life satisfaction relationship. In the condition where participants had to answer the health satisfaction question first (DS-LS condition), I did not find a difference in the correlations between health satisfaction and life satisfaction dependent on the priming condition. Thus, the question order did not impact the correlation in the two priming conditions. Whereas the pattern for healthy participants is consistent with the outlined assumptions, the health prime did not work as expected for unhealthy individuals. One potential reason for these results might be that the hospital primes did not activate health as strictly forward, as was expected. More specifically, the primes might even have activated different concepts in healthy compared to unhealthy individuals. Therefore, I conducted an additional post-hoc study, which focused on the qualitative description of the used primes.

Study 3: A Qualitative Post-Hoc Study

Study 2 described above aimed to prime individuals with health-related cues, such as hospitals, assuming that hospitals would activate knowledge of illness and health. However, because the study was labeled as a study of architecture, it might also be possible that individuals primarily focused on architectural aspects of the pictures shown. If so, participants' interpretation would have differed from what was intended to prime. To investigate this possibility in Study 3, I *qualitatively* examined what came into individuals' mind when seeing pictures of famous hospitals (as used in the health priming condition in Study 2).

Method

Participants. The sample of this study recruited from *Mechanical Turk* (N = 165) showed demographical distributions comparable to Study 2 (mean age = 36.13 years, SD = 11.76; 51% male, 49% female).

Design and measures. I presented participants with the same hospital primes as in Study 2. In an open-question format, participants were asked to describe what came into their mind. Answers were classified into four different categories: prime description that focused on illness aspects, prime description that focused on healing aspects, and prime description that focused on architectural aspects. A fourth category included all answers that were not classifiable. Subjects finally rated their subjective health status and provided some demographic information (see above).

Results

First of all, 6 participants were excluded because they did not provide any description of the prime (4%), resulting in N = 159. Coding the open answers revealed some interesting insights. For instance, only 22% of all individuals provided answers indicating that they were

thinking about illness (e.g., *"I was thinking about hospitals and diseases. I was thinking about what it is like to be sick…"* or *"Sick people and going to the emergency room. People in my family dying of cancer. Death and disease..."*). In all, 38% of individuals addressed points of healing and safety (e.g., *"The medical profession and people being treated"* or *"The thing that came to mind most was that these are top flight medical facilities in the U.S."*). However, nearly half of the participants (48%) were also describing aspects of architecture (e.g., *"I thought the buildings were beautiful and that the architecture and designs were very nice for the most part"* or *"The buildings are beautiful. The lightening, meaning the photograph itself, is also very impressive"*). Not surprisingly, some individuals just stated that they saw hospitals (17%; e.g., *"I recognized that they were all hospitals. That is really the only thing I thought"*). Of course, some individuals (26%) described several aspects of the categories, for example, the pictures as a place of help in a modern building. This is the reason why percentages do not sum up to 100% in the end due to multiple answers.

A closer look revealed that individuals interpreted the primes differently as a function of their self-rated health status. For example, whereas nearly half of the people who rated their health as good described hospitals in terms of their architecture (47%), only around one third of individuals with poor health focused on those architectural aspects (36%). Whereas over 41% of individuals with poor health status described hospitals in terms of illness, only 19% of the individuals with good health did so. Healing aspects were mentioned by 46% of poor health status individuals, but only by 34% of good health status individuals. Again, multiple answers were possible so that percentages do not sum up to 100%.

Discussion

The results of Study 3 suggest that individuals described the hospital primes of Study 2 quite differently (mostly in terms of either illness, healing, or architecture), and that healthy and unhealthy participants differed in their interpretation. For example, nearly half of the participants with good health status focused on architectural aspects of the hospitals, whereas individuals with poor health status described the illness-related and health-related aspects of the hospitals, such as help, support, or healing.

The findings provide evidence that the used environmental cues do not solely evoke health-related concepts as expected. This pattern might, in part, be caused by the title of the study (the study was introduced as a study about architecture), which is in line with research demonstrating that the introduction of the survey also impacts judgments (Smith et al., 2006). In combination, Study 2 emphasizes the need to carefully select the primes, and points directly to the caveat that environmental cues, as any primes, may elicit different cognitive reactions in different individuals (Konrath, Meier, & Schwarz, 2004).

References

Alves, H., Koch, A., & Unkelbach, C. (2017). Why good is more alike than bad: Processing implications. *Trends in Cognitive Sciences, 21*, 72–82. doi: 10.1016/j.tics.2016.12.006

Andrews, F. M., & Withey, S. B. (1974). Developing measures of perceived life quality: Results from several national surveys. *Social Indicators Research, 1*, 1–26. doi: 10.1007/BF00286419

Argyle, M. (2001). *The psychology of happiness*. London, UK: Routledge.

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5*, 323–370. doi: 10.1037//1089-2680.5.4.323

Boyce, C. J., Wood, A. M., Banks, J., Clark, A. E., & Brown, G. D. A. (2013). Money, well-being, and loss aversion: Does an income loss have a greater effect on well-being than an equivalent income gain? *Psychological Science, 24*, 2557–2562. doi: 10.1177/0956797613496436

Campbell, A., Converse, P. E., & Rodgers, W. L. (1976). *The quality of American life: Perceptions, evaluations, and satisfactions*. New York, NY: Russell Sage Foundation.

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*, 542–575. doi: 10.1037/0033-2909.95.3.542

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist, 55*, 34–43. doi: 10.1037/0003-066X.55.1.34

Diener, E. (2012). New findings and future directions for subjective well-being research. *American Psychologist, 67*, 590–597. doi: 10.1037/a0029541

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125*, 276–302. doi: 10.1037/0033-2909.125.2.276

Engel, J., & Bless, H. (2017). The more negative the more impact: Evidence from nationally representative data on the relation between domain satisfactions and general life satisfaction. *Social Psychology, 48*, 148–159. doi: 10.1027/1864-9335/a000305

Frey, B. S., & Stutzer, A. (2002). What can economists learn from happiness research? *Journal of Economic Literature, 40*, 402–435. doi: 10.1111/1468-0297.00570

Heller, D., Watson, D., & Ilies, R. (2004). The role of person versus situation in life satisfaction: A critical examination. *Psychological Bulletin, 130*, 574–600. doi: 10.1037/0033-2909.130.4.574

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *The Behavioral and brain sciences, 33*, 61-83. doi: 10.1017/S0140525X0999152X

Ito, T. A., Larsen, J. T., Smith, N. K., & Cacioppo, J. T. (1998). Negative information weighs more heavily on the brain: The negative bias in evaluative categorizations. *Journal of Personality and Social Psychology, 75*, 887–900. doi: 10.1037/0022-3514.75.4.887

Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Sciences of the United States of America, 107*, 16489–16493. doi: 10.1073/pnas.1011492107

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*, 263–292. doi: 10.2307/1914185

Konrath, S., Meier, B., & Schwarz, N. (2004). Seeing President Bush: Presidential pictures prime aggressive thoughts, perceptions, & behaviors. *Poster presented at American Psychological Society in Chicago, IL*.

Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Reexamining adaptation and the set point model of happiness: Reactions to changes in marital status. *Journal of Personality and Social Psychology*, *84*, 527–539. doi: 10.1037/0022-3514.84.3.527

Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2004). Unemployment alters the set point for life satisfaction. *Psychological Science*, *15*, 8–13. doi: 10.1111/j.0963-7214.2004.01501002.x

Lucas, R. E., & Donnellan, B. M. (2012). Estimating the reliability of single-item life satisfaction measures: Results from four national panel studies. *Social Indicators Research*, *105*, 323–331. doi: 10.1007/s11205-011-9783-z

Lyubomirsky, S. (2001). Why are some people happier than others? The role of cognitive and motivational processes in well-being. *American Psychologist*, *56*, 239–249. doi: 10.1037//0003-066X.56.3.239

Oishi, S., Diener, E., Suh, E., & Lucas, R. E. (1999). Value as a moderator in subjective well-being. *Journal of Personality and Social Psychology*, *67*, 157–184. doi: 10.1111/1467-6494.00051

Oishi, S., Schimmack, U., & Colcombe, S. J. (2003). The contextual and systematic nature of life satisfaction judgments. *Journal of Experimental Social Psychology*, *39*, 232–247. doi: 10.1016/S0022-1031(03)00016-7

Okun, M. A., Stock, W. A., Haring, M. J., & Witten, R. A. (1984). Health and subjective well-being: A meta-analysis. *International Journal of Aging and Human Development, 19,* 111–132. doi: 10.2190/QGJN-0N81-5957-HAQD

Pratto, F., & John, O. P. (1991). Automatic vigilance: The attention-grabbing power of negative social information. *Journal of Personality and Social Psychology, 61,* 380–391. doi: 10.1037/0022-3514.61.3.380

Robinson-Riegler, G. L., & Winton, W. M. (1996). The role of conscious recollection in recognition of affective material: Evidence for positive-negative asymmetry. *Journal of General Psychology, 123,* 93–104. doi: 10.1080/00221309.1996.9921263

Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review, 5,* 296–320. doi: 10.1207/S15327957PSPR0504_2

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52,* 141–166. doi: 10.1146/annurev.psych.52.1.141

Schimmack, U., Diener, E., & Oishi, S. (2002). Life satisfaction is a momentary judgment and a stable personality characteristic: The use of chronically accessible and stable sources. *Journal of Personality and Social Psychlogy, 70,* 345–384. doi: 10.1111/1467-6494.05008

Schimmack, U., & Oishi, S. (2005). The influence of chronically and temporarily accessible information on life satisfaction judgments. *Journal of Personality and Social Psychology, 89,* 395–406. doi: 10.1037/0022-3514.89.3.395

Schimmack, U., Schupp, J., & Wagner, G. G. (2008). The influence of environment and personality on the affective and cognitive component of subjective well-being. *Social Indicators Research*, *89*, 41–60. doi: 10.1007/s11205-007-9230-3

Schul, Y., & Schiff, M. (1993). Measuring satisfaction with organizations: Predictions from information accessibility. *Public Opinion Quarterly*, *57*, 536–551. doi: 10.1086/269394

Schwarz, N., & Strack, F. (1991). Evaluating one's life: A judgment model of subjective well-being. In F. Strack, M. Argyle, & N. Schwarz (Eds.), *Subjective well-being. An interdisciplinary perspective.* Oxford, UK: Oxford University Press.

Schwarz, N., & Strack, F. (1999). Reports of subjective well-being: Judgmental processes and their methodological implications. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 61–84). New York, NY: Russell Sage Foundation.

Schwarz, N., Strack, F., & Mai, H.-P. (1991). Assimilation and contrast effects in part-whole question sequences: A conversational logic analysis. *Public Opinion Quarterly*, *55*, 3–23. doi: 10.1086/269239

Smith, D. M., Schwarz, N., Roberts, T. R., & Ubel, P. A. (2006). Why are you calling me? How study introductions change response patterns. *Quality of Life Research*, *15*, 621–630. doi: 10.1007/s11136-005-4529-5

Strack, F., Martin, L. L., & Schwarz, N. (1988). Priming and communication: Social determinants of information use in judgments of life satisfaction. *European Journal of Social Psychology*, *18*, 429–442. doi: 10.1002/ejsp.2420180505

Suh, E., Diener, E., & Fujita, F. (1996). Events and subjective well-being: Only recent events matter. *Journal of Personality and Social Psyochlogy, 70,* 1091–1102. doi: 10.1037/0022-3514.70.5.1091

Wagner, G. G., Frick, J. R., & Schupp, J. (2007). The German Socio-Economic Panel Study (SOEP): Scope, evolution and enhancements. *Schmollers Jahrbuch, 127,* 139–169. doi: 10.2139/ssrn.1028709

Wiest, M., Schüz, B., Webster, N., & Wurm, S. (2011). Subjective well-being and mortality revisited: Differential effects of cognitive and emotional facets of well-being on mortality. *Health Psychology, 30,* 728–735. doi: 10.1037/a0023839

6.3 Paper #3: Lag and Lead Effects of Childbirth on Satisfaction Judgments

Lag and Lead Effects of Critical Life Events - Now You See Them, Now You Don't: Effects of Childbirth on Life Satisfaction and Domain Satisfactions

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Abstract

We investigated parents' subjective well-being (life satisfaction and different domain satisfactions) before and after the transition into parenthood, relying on nationally representative and longitudinal data (Socio-Economic Panel). Using lag and lead regression models, we found evidence for dynamic effects of childbirth on life satisfaction and domain satisfactions. Satisfaction with life in general, and less pronounced satisfaction with family life, showed a reversed u-shaped course, indicating both anticipation and adaptation to childbirth. Analyzing satisfaction with other specific domains, however, revealed a diverging pattern. We observed stable decreases in domain satisfactions after childbirth (leisure, household income, and sleep), stable increases (dwelling and job), as well as relatively stable satisfaction levels (household role and personal income). Moreover, gender modified parental satisfaction before and after childbirth, where women generally reacted more strongly to childbirth than did men. Additionally, reactions to childbirth were differentially related to employment status of women. Taken together, results suggest adaptation to transition into parenthood is dependent on which domain satisfaction judgments pertain to and on which specific subgroup of the sample is looked at.

Keywords: life satisfaction, domain satisfaction, childbirth, life events

Lag and Lead Effects of Critical Life Events - Now You See Them, Now You Don't: Effects of Childbirth on Life Satisfaction and Domain Satisfactions

Research from various domains has developed a pronounced interest in individuals' subjective well-being (Diener, 2013; Diener, Oishi, & Lucas, 2003; Dolan, Peasgood, & White, 2008; Lyubomirsky, 2001). In this respect, research has tried to identify variables that are correlated with individuals' reports of happiness and satisfaction. Not surprisingly, numerous variables have been examined, for example, money (Diener & Biswas-Diener, 2002; Dunn, Aknin, & Norton, 2008), personality traits (Costa & McCrae, 1980; DeNeve & Copper, 1998; Diener et al., 2003; Hayes & Joseph, 2003), social relations (Myers, 1999), or physical exercise (Penedo & Dahn, 2005); see Diener et al. (2003); Diener, Suh, Lucas, and Smith (1999); Ryan and Deci (2001), for overviews. The focus of the present paper rests on the questions of whether and how critical life events influence overall judgments of life satisfaction and more importantly, whether and how effects of critical life events *spillover* to other satisfaction domains.

Subjective Well-Being and Critical Life Events

Consistent research suggests that positive and negative life events can cause temporary and sometimes long-lasting changes in life satisfaction (Lucas, 2005; Luhmann, Hofmann, Eid, & Lucas, 2012). For example, it has been documented that *marriage* boosted life satisfaction in the year around the event, but was followed by a return to pre-marriage baseline level (Lucas, Clark, Georgellis, & Diener, 2003). Similarly, Clark and Georgellis (2013) found that individuals generally experienced an increase in life satisfaction around marriage, but over time, returned to their baseline level and fully adapted to marriage within two years. Adaptation to marriage also depended on individuals' baseline level of satisfaction (Lucas et al., 2003) - individuals who

were less satisfied before marriage were more likely to benefit from marriage compared to individuals who were more satisfied before marriage.

Following a *divorce*, people slowly adapted toward their baseline level, however, not completely (Lucas, 2005). Other studies yet reported complete adaptation to divorce (Clark, Diener, Georgellis, & Lucas, 2008). *Widowhood* seemed to have long lasting negative effects on life satisfaction (Lucas et al., 2003), and the strength of the initial reaction to widowhood modified the adaptation rate. The more negative the initial reaction to the death of the spouse, the lower the adaptation rate (Lucas et al., 2003).

Individuals who became *unemployed* rarely completely adapted, and reported permanent changes in life satisfaction (Clark & Georgellis, 2013; Lucas, Clark, Georgellis, & Diener, 2004). Even after *reemployment*, individuals did not return to their pre-unemployment baseline level (Clark, Georgellis, & Sanfey, 2001). Again, individuals' initial reaction to unemployment influenced their adaptation process. The more negatively individuals reacted to unemployment, the less likely was their adaptation (Lucas et al., 2004). *Job change*, in terms of promotion or voluntarily changing the job to work elsewhere, led to increases in life satisfaction, followed by adaptation (Boswell, Boudreau, & Tichy, 2005). This pattern repeated even when people changed their job several times.

The onset of *disabilities* led to moderate to strong decreases in life satisfaction. People experiencing a new disability recovered to some extent, although not completely (Lucas, 2007a). Considering positive events or desirable experiences, adaptation to, for example, *cosmetic surgery*, seemed to be small, and changes in life satisfaction were more sustainable. For instance, Wengle (1986) found that most patients were satisfied with the results of their operation, and their satisfaction did not decrease over time. Similarly, Margraf, Meyer, and Lavallee (2013)

showed in recent research that participants undergoing cosmetic surgery had higher levels of life satisfaction, which persisted a year after surgery compared to those interested in cosmetic surgery but not undergoing it. [1]

The findings related to these selective examples emphasize at least two important general issues. First, it seems important to acknowledge that for some critical life events, reports of life satisfaction remained surprisingly stable, whereas for other events, adaptation was observable. Thus, life events may sometimes cause temporary and sometimes long-lasting changes in life satisfaction (e.g., Lucas, 2005; Luhmann et al., 2012). Second, the findings suggest that at least for some life events, it may not be sufficient to examine subjective well-being after the critical event occurred because for some types of events, subjective well-being already changed prior to the event. We will address these two issues, *stability versus change*, and *anticipatory effects* in turn.

Life Satisfaction Over Time: Stability, Change, and Anticipation

What causes stability in life satisfaction? In early research on stability and change in life satisfaction, empirical evidence supported the assumption that satisfaction is stable over time. Indeed, some individuals are more satisfied than others, but whatever this level of satisfaction is, it has been considered as steady over time (e.g., Diener, Lucas, & Scollon, 2006). Two main arguments are proposed to explain the stability of life satisfaction, namely heritability and adaptation.

[1] Please note, however, that some researchers (Armenta, Bao, Lyubomirsky, & Sheldon, 2014) also argued that long-lasting effects of cosmetic surgery might be due to a slowed down adaptation process only and if individuals would be observed for a longer time period adaptation processes would occur sooner or later. They claimed that, for example, compliments after surgery increased people's self-confidence which in turn motivated individuals to meet new people, to engage in new activities and to seek challenging career opportunities. Positive emotions due to these changes, not to cosmetic surgery itself, could help to explain stable satisfaction levels after cosmetic surgery.

Life satisfaction stability is at least to some degree explained by a pronounced influence of heritability on life satisfaction. Lykken and Tellegen (1996) estimated that 44-52% of well-being are associated with genetic variation (see Nes & Roysamb, 2015, for recent meta-analytic evidence). In addition to the influence of heritability on life satisfaction, other processes render a life-long stability of life satisfaction likely - namely hedonic adaptation. Adaptation is defined as a psychological process by which individuals become accustomed to positive or negative stimuli, and the effect of this stimuli is attenuated over time (e.g., Frederick & Loewenstein, 1999). Critical life events have an impact on life satisfaction and may cause fluctuations. However, these changes in life satisfaction are often said to be only temporary, and that sooner or later, individuals *get used* to it and consequently return to their baseline level of satisfaction (Brickman & Campbell, 1971; Headey & Wearing, 1989). A seminal study supported the idea of hedonic adaptation to both positive and negative events over time: Individuals who experienced strong life events, such as winning the lottery or becoming disabled, did not differ as much as expected in their satisfaction levels one year after the event (Brickman, Coates, & Janoff-Bulman, 1978).[2]

Even if adaptation seems to be detrimental because it sends individuals to a treadmill where they theoretically can never become more satisfied with their life, adaptation has at least two important functions (Frederick & Loewenstein, 1999). First, adaptation *protects* individuals from (too) long lasting emotional states (e.g., fear or stress), which might lead to potentially harmfully psychological and physiological consequences. Second, adaptation enables individuals to *enhance their perception* for other issues and thus to shift their attention to changes.

What causes change in life satisfaction? Despite the evidence for genetic components and adaptation processes in life satisfaction, the notion of stability and inevitable hedonic

[2] Please note, however, this study has been heavily criticized for its statistical methodology and interpretation, see e.g., Lucas, 2007b, for a reinterpretation of the findings.

adaptation has been challenged recently (Lucas, 2007b), and new insights from longitudinal and nationally representative research have led to a reversal in adaptation research (Easterlin, 2005; Headey, 2006; see Lucas, 2007b, for an overview). Easterlin (2005), for example, refers to studies which examined the influence of onset of health issues. These studies have suggested that individuals with severe health issues do not adapt to their (new) health situation. Similarly, Lucas (2007a) reported that people do not completely adapt to long-term disabilities. Likewise, not all individuals completely adapt to divorce (Lucas et al., 2003).[3] In contrast to early studies, these studies demonstrated that adaptation is not always inevitable and not always complete.

When is life satisfaction stable, when does it change? Up to now, research has not concluded on a single, clear answer whether and - more importantly - to what extent hedonic adaptation occurs. Some research has supported adaptation; some research has suggested sustainable changes in life satisfaction (see Lucas, 2007b; Sheldon & Lucas, 2014, for overviews). These mixed empirical results might be due to some oversimplifications and broad generalizations in previous well-being research and emphasize the importance of bearing boundary conditions in mind. The following paragraph describes three boundary conditions, which may influence the hedonic adaptation process: the life event itself, inter-individual differences, and different components of subjective well-being.

First, the rate of adaptation varies across different *life events.* Life events may differ in the strength or valence of the reaction they cause. For example, negative life events seem to have a stronger influence on subjective well-being than do positive events (see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001, for overviews on a general negativity bias). As seen above, adaptation to marriage occurred, on average, within two years

[3] Individuals who reacted strongly to the divorce were "still far from baseline years later" (Lucas, 2003, p. 527).

(Lucas et al., 2003), adaptation to divorce was not complete and slower than to marriage, on average, within seven years (Lucas et al., 2003).

Second, change and stability of life satisfaction also depend on *inter-individual differences*. Some individuals, for example, have more resources to adapt more quickly to life events than others. Research on coping may explain these differences in adaptation, particularly differences in adaptation to negative events (Diener et al., 2006). As mentioned before adaptation also depends on individuals' baseline level of satisfaction, see Lucas et al. (2003), for examples.

Third, change and stability of life events depend on the considered *outcome variable*. For example, the effects of life events were different for the cognitive versus the affective component of subjective well-being. Luhmann et al. (2012) examined the effects of life events on different components of subjective well-being. Considering the direction of the effect of life events on subjective well-being, bereavement had initial negative effects on both cognitive and affective components of subjective well-being, whereas unemployment had a negative effect for the cognitive, but not on the affective component. Considering the strength of the effect of the life event on subjective well-being, Luhmann et al. (2012) concluded that most events had stronger effects on the cognitive than on the affective component of subjective well-being.

Moreover, the effects of life events are different for specific life domains. Easterlin (2005), for example, started to make a distinction between adaptation to economic domains (e.g., income, wealth) and non-economic life domains (e.g., health, family). He claimed that whereas adaptation to income and wealth was rather strong, adaptation to other life domains was not as straight-forward as expected. Whereas Luhmann et al. (2012) examined adaptation effects on the cognitive versus the affective component of subjective well-being and Easterlin (2005) distinguished between the effect of different events on different domains, no one, to our

knowledge, has ever examined the effect of *one* single event on the full facet of domain satisfactions and life satisfaction simultaneously. One exception constitutes the recently published work by Bernardi, Bollmann, Potarca, and Rossier (2017) who explicitly tested for spillover effects of transition into parenthood on life satisfaction and three domain satisfactions.

Why do we study anticipation? So far, we mainly focused on adaptation processes *after* a life event, but in some cases, life events may influence individuals' life satisfaction even *before* the occurrence of an event. The time period during which events exert influence before they occur is called anticipation period. Most life events are controllable, or at least to some extend predictable, and can, therefore, be anticipated. This holds especially true for the birth of one's child. Anticipatory effects may cause reactions before the event occurs (e.g., during pregnancy or time of planning to get pregnant). Prior research has shown that anticipatory effects may occur months to years before the actual event takes place (Clark et al., 2008). Pre-event levels of satisfaction may thus reflect reactions to the event and do, therefore, not necessarily constitute the habitual level of individuals' satisfaction.

Moreover, some life events are more likely to occur to some individuals than to others due to pre-existing inter-individual differences. Personality traits may increase the likelihood that individuals experience a specific life event, for instance, extraversion drives positive events, whereas neuroticism drives negative events (Headey, 2006). Similarly, pre-event baseline levels also influence the occurrence of an event. For example, happier people are more likely to get married (Stutzer & Frey, 2006), whereas unhappier people are more likely to become unemployed (Clark, 2003).

The above discussion highlights both the importance of critical life events for individuals' subjective well-being and the often complex nature of the underlying dynamics. In the next section, we elaborate on childbirth as a particular important event in individuals' life.

Transition into Parenthood as Critical Life Event

There is no doubt that the transition into parenthood fulfills criteria of the life event definition: It is a time-discrete transition that marks the beginning and the end of a specific status, and describes a transition from one status to another; in our case, having no child to having a child. Childbirth comes along with huge consequences, for example, for time use, financials resources, work-life balance, as well as for the relationship, and is, moreover, accompanied by a normative role change.

For various reasons, the birth of the first child is a particularly interesting life event. *First*, the event of childbirth is (mostly) irreversible and leads to permanent changes for the parents. Exceptions may include, for example, adoptions or death of the child but are not considered here in the present research. Many other events may be reversible, for example, one can easily imagine that being unemployed after losing one's job can be *revised* by re-employment. As such, a revision is obviously not possible in the case of having children because a child can be seen as a long lasting, irreversible life event, and might, therefore, exert a stronger influence than other life events.

Second, both positive and negative consequences for satisfaction measures after the birth of the first child are conceivable. For example, the dilemma between having less leisure time versus having beautiful moments with the child (see also below). This makes childbirth a particularly interesting event to study. Moreover, childbirth is likely to have spillover effects to other specific domains, and the effects for specific life domains may turn out quite differently.

That is, childbirth may affect certain domains positively while other domains are simultaneously affected negatively.

Third, the transition into parenthood implies more than just the event itself. The birth of the first child, of course, changes the life of parents for a considerable long time, but more importantly, the birth of the first child also has undeniable effects before birth, including, in some cases, the decision to get pregnant. Relatedly, individuals mentally may foresee the event of childbirth during the nine months of pregnancy. This allows not only for the investigation of adaptation, but also of *anticipation* effects. These anticipatory effects can be observed months or even years ahead and, therefore, the years before childbirth have to be part of a systematic investigation. If not, wrong conclusions could be drawn. Imagine, for example, a strong increase in life satisfaction before childbirth and a return to baseline after childbirth. Solely looking at the time after the event would lead to the conclusion that childbirth substantially decreases life satisfaction, whereas, in fact, positive effects of childbirth just do not last.

Transition into parenthood and its influence on life satisfaction. The birth of the first child affects parents' subjective well-being in diverse ways, positively and negatively including probably both rewards and stresses. Not surprisingly, the overall effects of childbirth on well-being are ambiguous and mixed (see Umberson, Pudrovska, & Reczek, 2010, for an overview).

The birth of the first child is often considered to be a positive event that many people strive for and are looking forward to. From an evolutionary perspective, reproduction ensures the survival of the species (Kendrick et al., 2010), and therefore wanting to have children can be considered as evolutionarily adaptive. Folk wisdom normally upholds that having children is central for a meaningful life (Baumeister, 1991), and indeed, childless women reported

significantly lower life satisfaction than women with children (Hansen, Slagsvold, & Moum, 2009).

However, transition into parenthood is also accompanied by negative consequences. For example, parents worried more and experienced higher levels of depression and anxiety than couples without children (McLanahan & Adams, 1987; Umberson et al., 2010). Specifically addressing the general evaluation of one's own life, most studies revealed that individuals' life satisfaction decreased after birth and returned to baseline level in the long run (Clark et al., 2008; Frijters, Johnston, & Shields, 2011) or even below baseline level (Luhmann et al., 2012). Moreover, effects of childbirth on subjective well-being depend heavily on which facet of well-being is considered (Luhmann et al., 2012). For the cognitive component of subjective well-being, namely life satisfaction, individuals generally experienced an increase around childbirth followed by a rapid decline toward baseline. For the affective component, however, parents first experienced fewer emotions around birth followed by increased positive emotions in the subsequent years. This suggests that even though life satisfaction may decrease, positive emotions may still increase.

Not only overall life satisfaction seems to be negatively influenced by childbirth, also specific domain satisfactions, such as relationship satisfaction and job satisfaction, seem to suffer from childbirth. For example, marital satisfaction declined after childbirth (Lawrence, Cobb, Rothman, Rothman, & Bradbury, 2008) and remained permanently lower than before childbirth (Luhmann et al., 2012). Similarly, observed and self-reported relationship quality decreased after transition into parenthood (Doss, Rhoades, Stanley, & Markman, 2009). In fact, relationship quality mostly decreased over time for all couples, but the decline was more sudden for couples with a child or more children. In addition to the family domain, the work domain is also

negatively influenced by childbirth. For example, Georgellis, Lange, and Tabvuma (2012) found that childbirth has long-lasting negative effects on the satisfaction with one's job.

In sum, childbirth may have temporary increases in general life satisfaction around the time of the birth, but is generally associated with lower satisfaction in some life domains. However, research has also demonstrated that satisfaction patterns following and preceding childbirth can be modified by demographic and socio-economic factors, such as gender and employment status.[4]

Gender differences and the effect of childbirth on life satisfaction and domain satisfactions. Not surprisingly, effects of childbirth on life satisfaction and domain satisfactions are likely to differ between women and men. Especially during the time of early care, roles of mothers and fathers are very different (e.g., Laflamme, Pomerleau, & Malcuit, 2002; Milkie, Bianchi, Mattingly, & Robinson, 2002). Mostly women, not men, reduce their working time (at least temporarily), and this holds especially true for countries with limited childcare possibilities, such as Germany (e.g., European Commission, 2009). Moreover, women prioritize family roles over working roles, despite women and men equally attribute importance to their family and work roles (Cinamon & Rich, 2002). A general increase of individualistic values and the still existing incompatibility of having children and having a career, especially for women (e.g., McDonald, 2000), may be one reason why people are postponing their decision to have children, and many parents have only one child even though they initially wished to have two children (European Commission, 2006).

[4] Previous research has also examined other moderating variables in the relationship between satisfaction and childbirth, such as parity and age of parenthood (Myrskyla & Margolis, 2014) or personality (Yap, Anusic, & Lucas, 2012), but that is not the focus of the present research.

Longitudinal studies investigated trajectories of life satisfaction for men and women separately (e.g., Clark & Georgellis, 2013; Dyrdal & Lucas, 2013). Women reported a greater increase in life satisfaction around childbirth, however, rapidly returned to their baseline level after birth (Clark & Georgellis, 2013). Men did not experience a significant increase in satisfaction after birth. In contrast, Dyrdal and Lucas (2013) found comparable reactions of both men and women to childbirth, with an initial anticipation boost and subsequent adaptation within two years.

Mostly in line with these findings, a very recent study specifically addressing spillover effects on domain satisfactions observed that although men showed a nonlinear decrease of general life satisfaction and stable levels of job satisfaction, women generally reacted more strongly to childbirth, with substantial decreases in leisure satisfaction and more fluctuations in job satisfaction (Bernardi et al., 2017).

Employment status and the effect of childbirth on life satisfaction and domain satisfactions. Employment status is likely to modify the influence of childbirth on life satisfaction and domain satisfactions, especially for women. Although full-time or part-time employed women are more likely to experience the work-family conflict as described above, unemployed women do not necessarily have as many stressors, at least less work-related stressors than employed women. Please note, that this of course only applies to voluntarily unemployed women. Involuntarily unemployed women indeed may be exposed to work-related stressors, such as strenuous application procedures or financial concerns. Generally, labor force participation rate strongly decreases after childbirth in Germany. Whereas 83% of all women without children are employed, only 63% of women with children are employed (Statistisches Bundesamt, 2009). So far, research mostly restricted its analyses a-priori to full-time and part-

time employed participants (see e.g., Bernardi et al., 2017), and has largely ignored that the effects of childbirth may differ strongly, dependent on whether women are employed or not.

Overview of the Present Study

Based on the above review of the existing theoretical and empirical research on the relation between childbirth and satisfaction judgments, the present study examined how the birth of the first child influences different domain satisfactions and life satisfaction in general. Based on data from a representative panel (Socio-Economic Panel; Wagner, Frick, & Schupp, 2007), we used a lag and lead regression-analytical design which particularly allows for the investigation of adaptation and anticipation processes. Our aim was to track changes in life satisfaction and possible spillover effects to different domain satisfactions before, during, and after the birth of the first child. In our study, we addressed two main research questions that are - in part - of an explorative nature.

1. Which *satisfaction judgments* are affected by childbirth? When and in which domains does adaptation and anticipation occur? Based on previous research, we expected that childbirth has an initial positive effect on general life satisfaction as well as on family life satisfaction, but people adapt to childbirth in these domains relatively quickly. Moreover, we expected general life satisfaction and family satisfaction to increase before birth. For the satisfaction domains of sleep and leisure time, we expected negative effects with little to no adaptation within the considered observation window. Predictions about the consequences for all other considered domain satisfactions (health, household role, household and personal income, dwelling) are of an explorative nature.

2. Do changes in life satisfaction and domain satisfactions differ before and after childbirth in different *subgroups,* men versus women and women with different employment status? Based on previous research, we generally expected women to react more strongly to the birth of their first child compared to men. The research question tackling the influence of childbirth on satisfaction judgments in women with different employment status is of an explorative nature.

Method

Data

For the present study, we relied on data from the Socio-Economic Panel (Wagner et al., 2007), a large-scale survey of the German population. We considered data from 1992, the first year of the survey in a reunited Germany, until the most recent wave at the time of the analyses in 2013. In addition to providing a large sample size, Socio-Economic Panel data come with the advantages of a panel study in which the same individuals are interviewed every single year.

Participants

For our analyses, we considered all adults (18-65 years) who became parents during the sampling period (1992-2013). Respectively, we excluded all individuals who already had children before entering the survey as well as all individuals who were still childless at the end of our sampling period. Moreover, we restricted our sample to families with one child only in the sampling period. This restriction should have no effect for the years prior to the first childbirth. In the long run, we of course readily admit that families deciding to have more children within the observation window may differ systematically from families who decide not to have more than one child. We will return to this issue in the discussion.

In total, the overall sample considered 2,863 individuals who experienced the birth of the first child. Gender was equally distributed (female 50%, male 50%). In all, 71% of our overall sample were married, 24% were single at the time of birth (remaining 5%: others, such as divorced, widowed, same sex marriages, etc.). Nearly half of the participants were either full-time or part-time employed (49%) at the time of birth of the first child whereas 46% were not employed at the time of birth (remaining 5%: others, such as in-service training or partial retirement).

Data Analyses

For our longitudinal analyses, we used fixed effect regressions to identify the effect of the birth event over time. Through demeaning variables entering the regression, time-constant heterogeneity is controlled in this type of regression analyses (e.g., Wooldridge, 2015). This procedure controls for unobserved fixed effects (e.g., stable personality traits, gender, etc.) that may either influence satisfaction measures (e.g., effects of a specific trait on satisfaction) or the occurrence of the event (e.g., effects of a specific trait on childbirth). Moreover, this within-approach holds the advantage of studying anticipation and adaptation *within* the same individual, and it ensures that the same individual is followed through.

We first identified the birth of the first child during the considered sampling period (1992-2013). The event took place if individuals reported having one child in the household at time *t*, while not reported having a child at time *t*-1.

To examine how life satisfaction and domain satisfactions varied in the years before and after the transition into parenthood, we computed *lag* and *lead* variables. Lag and lead variables capture time to and time since the birth of the first child (from four years before birth to more than four years after birth). Lag variables identify evidence of adaptation in the years following a

major life event, and lead variables identify evidence of anticipation in the years preceding a major life event. For example, the lag variable for having a child for one year is identified by individuals who reported to have a child one year ago, but not two years ago. Similarly, we created lead variables to identify individuals who did not have a child at a certain time, but became a parent the next year. Following the approach offered by Georgellis et al. (2012), we included all lag and lead variables within one single equation to make the lag and lead variables directly comparable.[5]

Generally, the time points which are not captured by the lag and lead variables serve as a reference category. In our case, the reference category included the time more than four years prior to childbirth. Increases and decreases in life satisfaction and domain satisfactions, therefore, referred to changes compared to satisfaction levels *more than four years* prior to childbirth.

Measures

Life satisfaction and domain satisfactions. Life satisfaction and domain satisfactions were measured on scales ranging from 0 (= *completely dissatisfied*) to 10 (= *completely satisfied*). We investigated all available domains which were assessed in all the considered waves of the Socio-Economic Panel (satisfaction with health, sleep, job (if employed), household role, household income, personal income, dwelling, leisure, and family life). The item measuring life satisfaction reads as follows: “How satisfied are you with your life, all things considered?” The items measuring domain satisfactions read as follows: “How satisfied are you with your health/ sleep/ job/ …/ family life?”

[5] Earlier studies (e.g., Clark et al., 2008) estimated two separate equations, one for anticipation effects and one for adaptation effects, and as a resulting problem there were two baselines. Within our approach effects before and after the event were directly comparable.

Control variables. In line with other research on life satisfaction that relied on representative samples (e.g., Clark et al., 2008), we controlled for important variables influencing both general life satisfaction and domain satisfactions. To control for time changing variables, we included age, socio-economic status (education measured in years and logged monthly household net income measured in Euros per month), as well as marital status (1 = married, 2 = single, 3 = widowed, 4 = divorced, 5 = separated) and employment status (1 = full-time employment, 2 = part-time employment, 3 = apprenticeship, 4 = minor employment, 5 = unemployment) in our equation. Note that time constant variables, such as gender, were automatically controlled for by the fixed effect regression approach.

Results

Overall Sample

Individuals in the present sample reported relatively high overall life satisfaction as well as domain satisfactions. For instance, individuals' mean life satisfaction varied between 6.74 (*SD* = 1.73) and 7.47 (*SD* = 1.58) during the time from four years before to more than four years after transition into parenthood. This is consistent with previous research showing that individuals are, in general, relatively satisfied with their life (e.g., Diener & Diener, 1996). Table 1 summarizes means and standard deviations of overall life satisfaction and domain satisfactions in the year of the event, as well as in the years before and after the birth of the first child. For better visualization, results are also plotted in Figure 1.

Solely considering the pattern of means descriptively, it can be seen that satisfaction with life in general increases around childbirth, but descriptively decreases after birth of the first child, and remained at a lower level than in the years before birth. Satisfaction with family life also revealed a reversed u-shaped course over time, with an increase in satisfaction before

childbirth and a decrease after the event. Both satisfaction with personal income and satisfaction with sleep showed a drop around childbirth and recovered slowly and remained lower than before childbirth. Similarly, satisfaction with health constantly decreased over time after childbirth. Several domain satisfactions seemed to be relatively unaffected by childbirth and persisted to be relatively stable over time. Satisfaction with household role, job, and household income showed little decreases over time and remained slightly lower after than before birth of the first child. Satisfaction with dwelling increased only very little over time.

Means and standard deviations can only paint a rough picture of the influence of childbirth on life satisfaction and domain satisfactions. We, therefore, do not discuss all our subsamples here in detail. As pointed out before, satisfaction judgments are complex and very likely to be influenced by various variables and circumstances. Drawing causal conclusions based on means is very likely to oversimplify the process of life satisfaction and domain satisfaction judgments. In a subsequent step, we analyzed the effect of childbirth on life satisfaction and domain satisfactions by using a lag and lead regression analytical design.

Table 1

Overall Sample - Means and Standard Deviations in Parentheses for Life Satisfaction and Domain Satisfactions Before and After Childbirth

Years before and after childbirth	LS	Health	Sleep	Job	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	7.23 (1.63)	7.48 (1.97)	7.70 (1.82)	7.14 (2.12)	6.76 (1.99)	6.37 (2.24)	6.03 (2.34)	7.45 (2.11)	6.65 (2.16)	7.83 (1.98)
-3	7.28 (1.62)	7.42 (1.98)	7.28 (2.14)	7.17 (2.02)	6.78 (1.96)	6.35 (2.23)	6.01 (2.42)	7.50 (2.09)	6.63 (2.20)	7.67 (1.96)
-2	7.27 (1.61)	7.40 (1.91)	7.43 (1.93)	7.11 (2.03)	6.95 (1.93)	6.43 (2.22)	6.05 (2.48)	7.60 (2.03)	6.71 (2.16)	8.14 (1.68)
-1	7.41 (1.61)	7.49 (1.93)	7.06 (2.17)	7.07 (2.06)	6.87 (1.91)	6.32 (2.26)	5.85 (2.50)	7.49 (2.08)	6.79 (2.15)	8.24 (1.68)
0 (childbirth)	7.47 (1.58)	7.48 (1.87)	6.34 (2.34)	7.07 (2.10)	6.77 (1.94)	6.04 (2.27)	5.33 (2.65)	7.31 (2.18)	6.38 (2.21)	8.40 (1.60)
+1	7.14 (1.64)	7.22 (1.96)	6.69 (2.10)	6.98 (2.03)	6.61 (1.92)	6.08 (2.17)	5.26 (2.73)	7.35 (2.12)	6.37 (2.20)	8.12 (1.70)
+2	7.04 (1.66)	7.09 (1.96)	6.74 (2.03)	6.91 (2.05)	6.55 (1.95)	6.02 (2.20)	5.46 (2.61)	7.47 (2.05)	6.31 (2.21)	7.78 (1.84)
+3	6.88 (1.72)	6.98 (1.99)	6.80 (2.15)	6.93 (2.08)	6.57 (1.86)	6.02 (2.22)	5.48 (2.56)	7.56 (2.06)	6.36 (2.21)	7.69 (2.02)
+4	6.87 (1.72)	6.91 (2.04)	6.76 (2.17)	6.91 (2.18)	6.60 (1.90)	5.91 (2.29)	5.58 (2.50)	7.50 (2.04)	6.40 (2.26)	7.54 (2.09)
> +4	6.74 (1.73)	6.66 (2.10)	6.77 (2.21)	6.81 (2.09)	6.63 (1.90)	6.00 (2.27)	5.61 (2.46)	7.61 (1.88)	6.49 (2.19)	7.42 (2.17)

Note. LS = life satisfaction; HH = household; Inc = income. Socio-Economic Panel, data from 1992 to 2013.

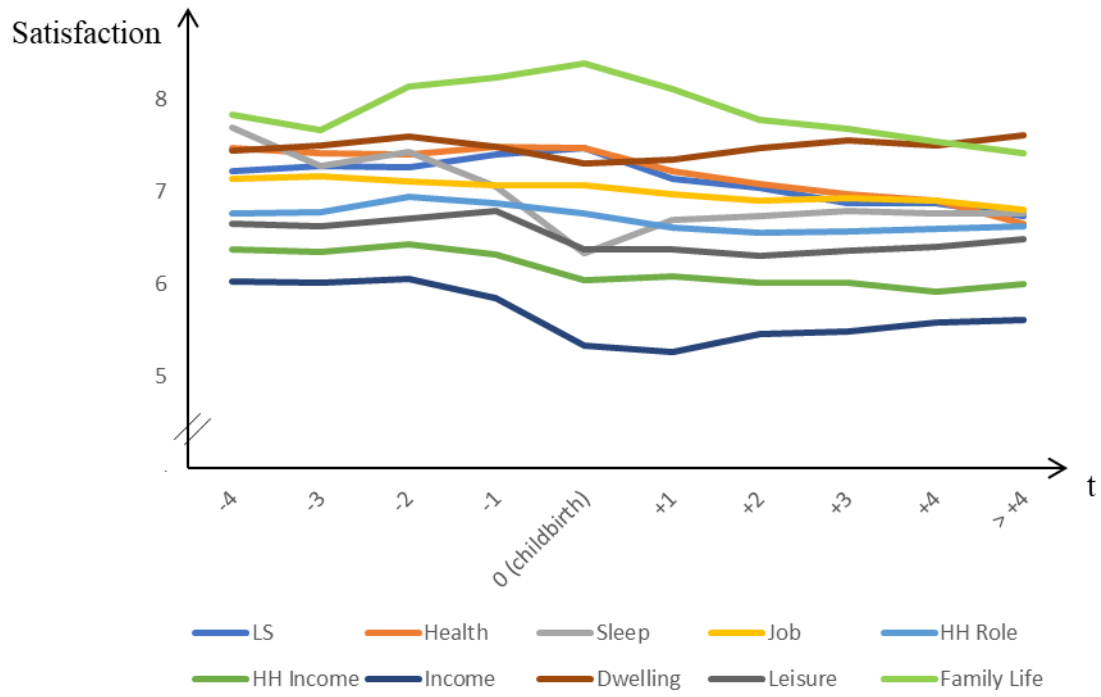


Figure 1. Overall sample - Means for life satisfaction and domain satisfactions before and after childbirth. *Note*. LS = life satisfaction; HH = household. Socio-Economic Panel, data from 1992 to 2013.

Table 2 and Figure 2 summarize the effects of the birth of the first child on life satisfaction and different domain satisfactions in the years before, the year of the event, and the years after the event in our lag and lead regressions. Table 2 also provides an overview of the effects of several control variables (age, education, marital status, income, and employment status), which we will not discuss in the following, but which were included in our analyses to control for the potential influences of these variables on life satisfaction and specific domain satisfactions.

Our analyses revealed that the strongest impact of childbirth on life satisfaction and most domain satisfactions emerged at the time of the event itself. For instance, in the year of experiencing a childbirth, satisfaction with life (b = .380, $p < .001$), health (b = .230, $p < .001$), and job (b = .227, $p = .001$) increased significantly compared to baseline levels. Moreover, in the

year of the event, satisfaction with sleep (b = -.609, $p < .001$) and with leisure (b = -.615, $p < .001$) decreased significantly compared to baseline levels. Interestingly, birth of the first child did not significantly influence other domains of life, for example, satisfaction with household role, household income, personal income, and dwelling. Perhaps most surprisingly, satisfaction with family life in the year of childbirth was unaffected by the event.

Table 2 and Figure 2 display additional significant lag and lead effects for both overall life satisfaction as well as for specific domain satisfactions. Overall life satisfaction significantly increased in the year before birth compared to baseline levels, which reflects that temporary increases in satisfaction were not restricted to the year of birth itself, but were also observable in the preceding year (b = .185, $p < .001$). Descriptively, we found a reversed u-shape for life satisfaction, and less pronounced for health satisfaction, and satisfaction with family life.

Most obviously, the transition into parenthood had negative long-term consequences for parents' satisfaction with their leisure time and for their satisfaction with household income - though the latter did not always reach statistical significance. Satisfaction with job increased compared to baseline levels in some years after childbirth. Satisfaction with sleep descriptively decreased in the years after childbirth and was significantly higher in the years before transition into parenthood compared to baseline levels.

Table 2

Overall Sample - Lag and Lead Effects of Childbirth on Life Satisfaction and Domain Satisfactions

Years	LS	Health	Sleep	Job	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	-.021	.061	**.694***	.052	.019	**.108***	.065	.083	-.046	-.005
-3	.033	.030	.371	.049	.062	-.003	.093	**.139***	-.019	-.205
-2	.013	.028	**.488***	-.009	**.177****	.044	.091	**.241*****	.032	.202
-1	**.185*****	**.167****	.132	.026	.084	-.017	.077	**.137***	.053	.286
0 (childbirth)	**.380*****	**.230*****	**-.609*****	**.227****	.036	-.093	.003	-.064	**-.615*****	.337
+1	.041	.049	-.138	**.145***	-.117	-.079	-.193	-.066	**-.602*****	.029
+2	-.027	.002	-.149	.049	**-.164***	**-.149***	-.054	.045	**-.615*****	-.288
+3	-.074	-.037	-.122	**.168***	-.120	-.067	.014	**.164***	**-.529*****	-.279
+4	-.028	.031	-.141	.155	-.081	**-.201****	.005	.046	**-.449*****	-.349
> +4	**-.114***	.072	---	**.186***	-.109	**-.197****	-.067	.103	**-.488*****	-.447
Controls										
Age	**-.023*****	**-.062*****	**-.055*****	**-.042*****	**.011*****	**-.010*****	**.050*****	**.017*****	**.019*****	.001
Education	**-.023*****	**.014***	.027	-.016	.008	**-.028*****	-.033	**-.027*****	.007	.005
Marital status (ref = married)										
Married, sep	**-.344*****	.054	-.114	**.156****	**.108***	**-.227*****	.044	**-.109***	**.162****	**-1.452*****
Single	-.040	.045	.087	.017	-.041	**-.074***	.092	-.051	**.175*****	**-.272*****
Divorced	-.023	.070	-.011	.010	.062	**-.110***	.040	-.058	.079	**-.341****
Widowed	-.120	.062	-.339	.203	**.173***	**.420*****	**.685*****	**.220****	**.368*****	**-2.014*****
Spouse abroad	-.195	.155	---	.147	.110	.005	.130	-.659	-.371	---
SS, living together	**-.710***	-.166	-.152	.219	.065	-.111	-.310	-.453*	-.090	-.167
SS, living sep	**.397*****	**-.205*****	.056	**-.730*****	**1.645*****	**1.633*****	**1.986*****	**.208****	**1.448*****	**-.888*****
Log income	**.315*****	**.108*****	**.088***	**.277*****	.033	**1.200*****	**.777*****	**.247*****	**.056****	**.229*****
Employment status (ref = full-time job)										
Part-time job	**-.094*****	-.009	-.070	**-.169*****	.001	**-.342*****	**-.481*****	.010	**.535*****	.036
Apprenticeship	-.022	**-.058***	-.020	**.102***	-.080	**-.370*****	**-.506*****	**.083***	**.389*****	.118
Minor employment	**-.228*****	-.016	-.025	**-.523*****	**-.082***	**-.597*****	**-1.077*****	-.027	**.796*****	.040
Unemployment	**-.320*****	**-.055****	.023	**-1.629*****	**-.082*****	**-.695*****	**-1.683*****	.018	**1.018*****	**.095****

Note. LS = life satisfaction; HH = household; Inc = income; ref = reference; sep = separately; SS = same sex. Socio-Economic Panel, data from 1992 to 2013. *** $p < .001$. ** $p < .01$. * $p < .05$.

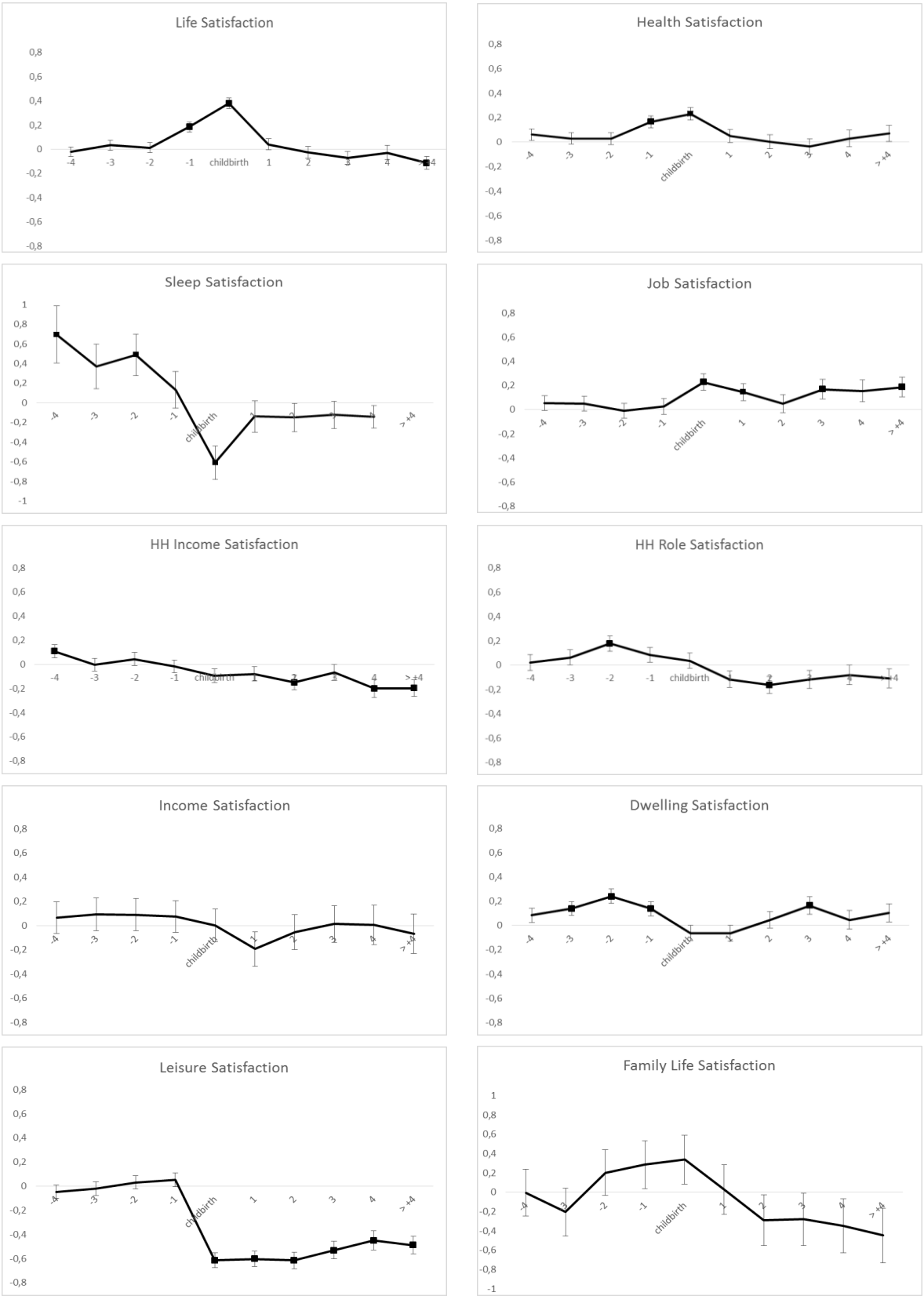


Figure 2. Overall sample - Lag and lead effects of childbirth on life satisfaction and domain satisfactions. *Note*. HH = household. ■ = $p < .05$.

Gender

In further analyses, we separately investigated effects of the birth of the first child on life satisfaction and domain satisfactions for men and women. We considered 1,421 births for women and 1,442 births for men. On average, women had an age of 30.35 years (*SD* = 7.16) and men of 33.33 years (*SD* = 7.63) at the time of the birth of the first child. Marital status at the time of birth was comparable for female and male participants (female: married 70%, single 24%; male: married 71%, single 22%, remaining percentages: others). Pronounced differences were obtained for employment status at time of childbirth. Whereas male participants were mostly full- or part-time employed (85%), only 15% of the female participants were full- or part-time employed.

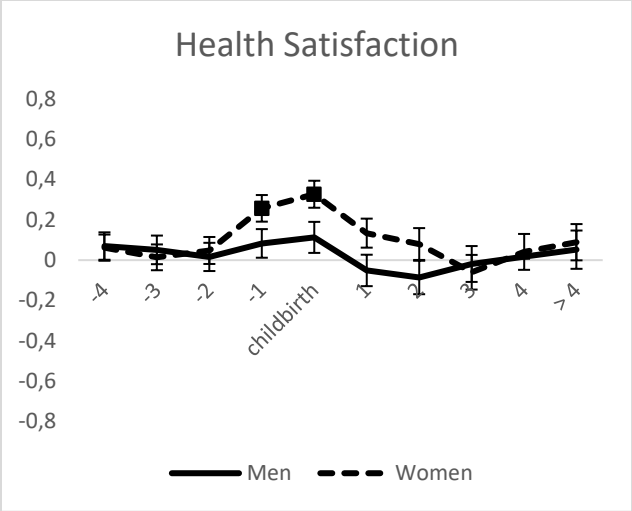
Plotted means and standard deviations for the gender subsamples are provided in the Appendix (see Figures A1 and A2, Tables A1 and A2). Courses of satisfaction in the years before and after childbirth were comparable between men and women. For example, both women and men showed the reversed u-shaped course for family life satisfaction. Differences between men and women were found in other domain satisfactions. For instance, women showed a deep decrease in sleep satisfaction and personal income satisfaction, whereas men's sleep satisfaction was not affected and satisfaction with personal income was positively affected by childbirth.

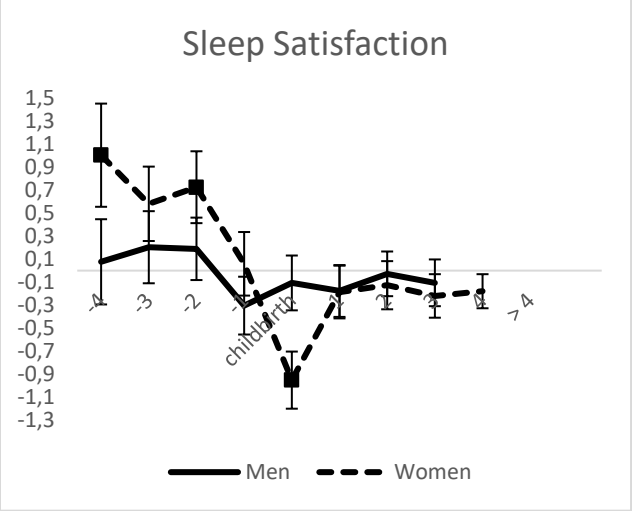
The effect of childbirth on general life satisfaction was positive for both men and women in the year of childbirth itself (men: b = .198, $p = .001$; women: b = .511, $p < .001$; see Figure 3 and Tables A6 and A7). Similarly, women and men both reported significantly lower satisfaction levels with their leisure time (men: b = -.188, $p = .022$; women: b = -1.116, $p < .001$). However, we also found various differences between men and women in the course of overall life

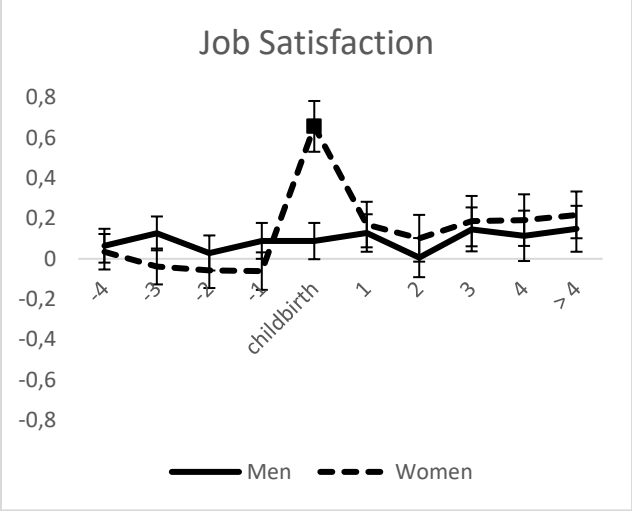
satisfaction and of specific domain satisfactions in the year of the transition into parenthood. For example, women's satisfaction with sleep significantly decreased in the year of childbirth, whereas men did not report significant decreases in their sleep satisfaction compared to baseline levels. Men's satisfaction with household role increased, whereas women's satisfaction with their household role decreased in the year of childbirth. Whereas for women, the analyses revealed negative lag effects of childbirth for satisfaction with household role, leisure, and family life, the negative lag effects for men pertained primarily to satisfaction with household income and personal income.

Interestingly, men's satisfaction with family life significantly increased in the year of childbirth, whereas for this period we found no effect for women, who became less satisfied with their family life in the years following childbirth. The often-reported reversed u-shaped course for family life satisfaction only held for male, but not for female participants in our data.

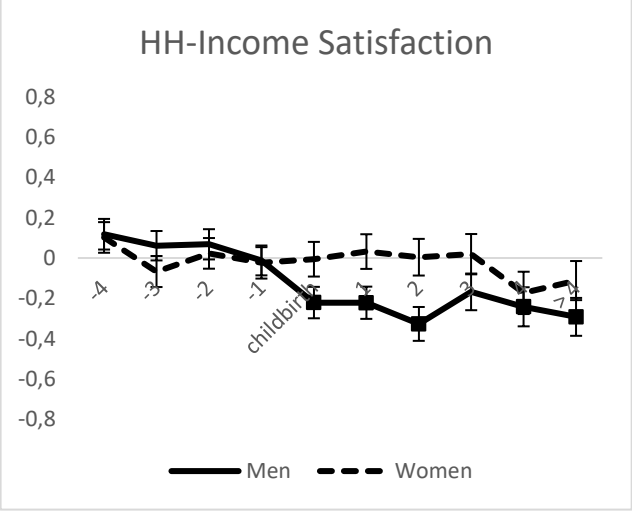

Life Satisfaction
0,8
0,6
0,4
0,2
0
-0,2
-0,4
-0,6
-0,8
childbirth
Men
Women


Health Satisfaction
0,8
0,6
0,4
0,2
0
-0,2
-0,4
-0,6
-0,8
childbirth
Men
Women


Sleep Satisfaction
1,5
1,3
1,1
0,9
0,7
0,5
0,3
0,1
-0,1
-0,3
-0,5
-0,7
-0,9
-1,1
-1,3
childbirth
Men
Women


Job Satisfaction
0,8
0,6
0,4
0,2
0
-0,2
-0,4
-0,6
-0,8
childbirth
Men
Women


HH-Role Satisfaction
0,8
0,6
0,4
0,2
0
-0,2
-0,4
-0,6
-0,8
childbirth
Men
Women


HH-Income Satisfaction
0,8
0,6
0,4
0,2
0
-0,2
-0,4
-0,6
-0,8
childbirth
Men
Women

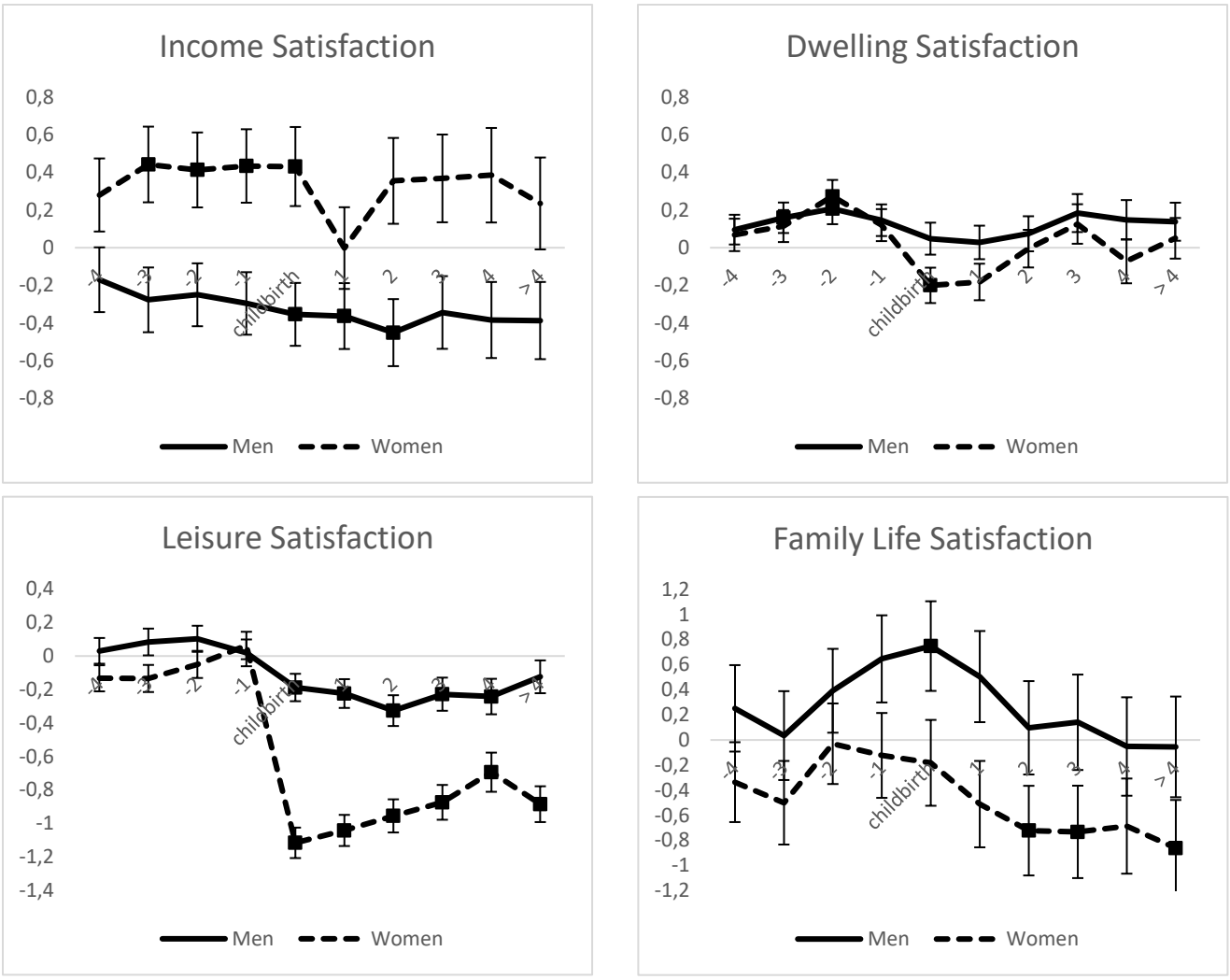


Figure 3. Male and female sample - Lag and lead effects of childbirth on life satisfaction and domain satisfactions. *Note*. HH = household. ■ = $p < .05$

Employment Status in Women

In further analyses, we separately investigated satisfaction judgments of women with different employment status. The rational for these analyses rests on the assumption that childbirth may be associated with quite different consequences, depending on women's employment status. We included women who were full- or part-time employed four years before childbirth until four years after childbirth (employment), women who were unemployed four years before childbirth until four years after childbirth (unemployment), and women who were first employed four years before birth, but unemployed in the four years after childbirth (changing employment). Please note that these subgroups only represent slightly above one fifth of all female participants.

For constantly employed women, we considered 123 births. Mean age at the time of transition into parenthood was 35.50 years (*SD* = 7.92 years). Employed women were mostly married at the time of birth (71%), 23 % were single (remaining 6%: others). 62% were full-time employed and 38% were part-time employed. For constantly unemployed women, we observed, in total, 142 births of the first child. Average age at birth of the first child was 31.03 years (*SD* = 13.09 years). In all, 72% were married and 18% were single (remaining 10%: others). Women who worked in the years before birth and were unemployed after birth allowed us to observe 33 births. Mean age at birth was 35.64 years (*SD* = 8.83 years). 76% were married and 9% were single (remaining 15%: others).

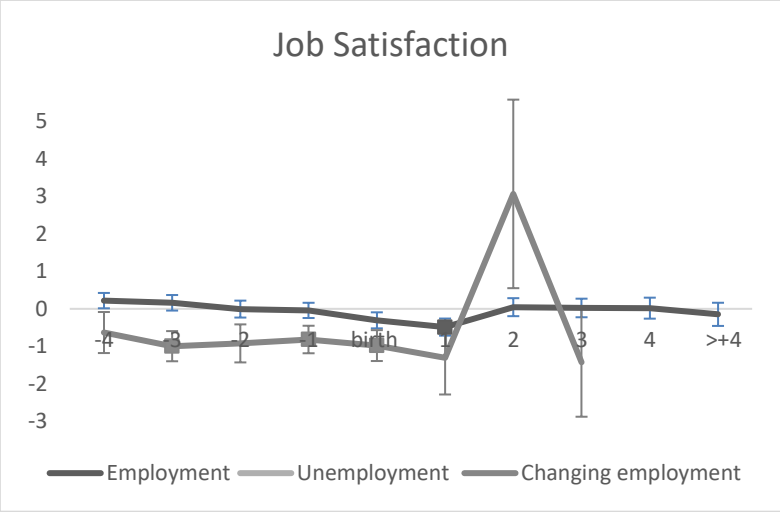
The analyses did not reveal pronounced differences in the means and standard deviations between employed women, unemployed women, and women who experienced a change in their employment status (see Tables A3, A4, and A5). Figure 4 displays the plots of the dynamic effects of childbirth on the satisfaction variables obtained from the lag and lead regression

analyses (see also Tables A9, A10, and A11). In comparison to our overall sample, we generally observed less ups and downs in life satisfaction and domain satisfactions around childbirth. The pronounced reversed u-shaped pattern in life satisfaction did not emerge in any of the three subgroups. It can be seen, however, that unemployed women were more satisfied with their life after childbirth, whereas satisfaction judgments of employed women did not reflect any significant differences due to childbirth, and only showed descriptively lower satisfaction levels after childbirth. Independent of employment status, women experienced a decrease in leisure satisfaction after childbirth. Satisfaction with income and with household income seemed relatively unaffected by childbirth in all three groups: employed, unemployed, and changing employed women. Similarly, satisfaction with health and dwelling showed some fluctuations, but no clear effects of childbirth could be observed.

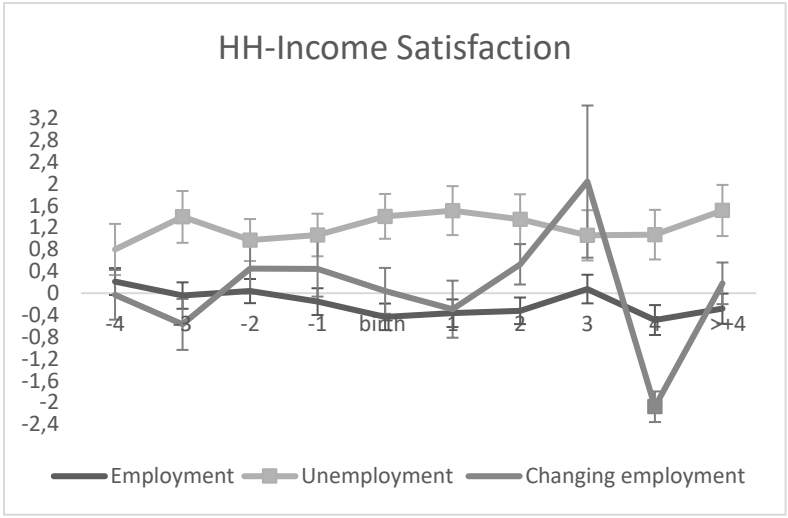

Life Satisfaction
1,4
1,2
1
0,8
0,6
0,4
0,2
0
-0,2
-0,4
-0,6
-0,8
-1
-1,2
-4
-3
-2
-1
birth
1
2
3
4
>+4
Employment
Unemployment
Changing employment


Health Satisfaction
2,2
1,8
1,4
1
0,6
0,2
-0,2
-0,6
-1
-4
-3
-2
-1
birth
1
2
3
4
>+4
Employment
Unemployment
Changing employment


Sleep Satisfaction
3,1
2,7
2,3
1,9
1,5
1,1
0,7
0,3
-0,1
-0,5
-0,9
-1,3
-1,7
-2,1
-2,5
-2,9
-3,3
-4
-3
-2
-1
birth
1
2
3
4
>+4
Employment
Unemployment
Changing employment


Job Satisfaction
5
4
3
2
1
0
-1
-2
-3
-4
-3
-2
-1
birth
1
2
3
4
>+4
Employment
Unemployment
Changing employment


HH-Role Satisfaction
1,9
1,5
1,1
0,7
0,3
-0,1
-0,5
-0,9
-1,3
-1,7
-2,1
-4 -3 -2 -1 birth 1 2 3 4 >+4
Employment
Unemployment
Changing employment


HH-Income Satisfaction
3,2
2,8
2,4
2
1,6
1,2
0,8
0,4
0
-0,4
-0,8
-1,2
-1,6
-2
-2,4
-4 -3 -2 -1 birth 1 2 3 4 >+4
Employment
Unemployment
Changing employment


Income Satisfaction
1,5
1
0,5
0
-0,5
-1
-1,5
-2
-2,5
-3
-3,5
-4
-4,5
-4 -3 -2 -1 birth 1 2 3 4 >+4
Employment
Unemployment
Changing employment


Dwelling Satisfaction
1,6
1,2
0,8
0,4
0
-0,4
-0,8
-1,2
-4 -3 -2 -1 birth 1 2 3 4 >+4
Employment
Unemployment
Changing employment

Figure 4. Employed, unemployed, and changing employed female sample - Lag and lead effects of childbirth on life satisfaction and domain satisfactions. *Note*. HH = household. ■ = $p < .05$

Discussion

The present research addresses parental trajectories in overall life satisfaction and specific domain satisfactions before and after the birth of the first child. The analyses were based on large-scale longitudinal data and they clearly indicated that childbirth influences individuals' satisfaction judgments in the year of the event itself, the subsequent years, and the preceding years. Although in general, results supported our hypothesis that childbirth has both positive and negative effects on satisfaction judgments, the obtained findings at the same time pointed to the complexity of the consequences of childbirth - reflecting differential effects of childbirth at different times, for different subgroups, and for different judgments of satisfaction.

With respect to *overall life satisfaction*, we observed an increase in satisfaction in the year before, and in the year of birth. This increase, however, diminished in the years after childbirth. This pattern is consistent with prior research (see e.g., Clark et al., 2008; Clark & Georgellis, 2013; Frijters et al., 2011; Myrskyla & Margolis, 2014). This reversed u-shaped satisfaction pattern has been interpreted as the combination of anticipation and adaptation processes, and has been treated as support for a set point assumption and similar theoretical approaches on hedonic adaptation (Diener et al., 2006; Headey & Wearing, 1989; Lykken & Tellegen, 1996).

Although in general (for the whole sample, for overall life satisfaction), the obtained pattern reflected the typical reversed u-shaped function, a closer look revealed that this pattern did not hold up for all subgroups and for all specific satisfaction domains (for related evidence on the notion that averaged patterns and patterns for subgroups may strongly diverge, see Mancini, Bonanno, & Clark, 2011). Thus, adaptation processes might be at work on average, but quite different courses from stable increases to stable decreases were observable depending on

which subgroup and which facets of subjective well-being were considered. We address these deviations in turn.

The obtained findings revealed that although the reversed u-shaped course of overall life satisfaction was observable for men, this pattern was much more pronounced for women, supporting previous research on gender differences in reactions to life events (see e.g., Bernardi et al., 2017). Quite obviously, although traditional gender roles of parental caregiving and breadwinning identity seem to attenuate to some degree (Statistisches Bundesamt, 2016), the effects of childbirth are much stronger for women than for men. Interestingly, this holds for both the lead and the lag effects. A similar picture emerged when turning the perspective from overall life satisfaction to specific satisfaction domains. It is remarkable that for men, satisfaction with the majority of specific domains was basically unaffected, whereas for women, the majority of the domains reflected influences of childbirth. Three specific domains showed a reversal pattern from this general pattern: Men's compared to women's satisfaction judgments were strongly affected by childbirth when satisfaction pertained to household and personal income satisfaction and family life satisfaction. Relatively little research directly addresses the issue of why childbirth influences these domains in particular, however, considering research on attitudes toward gender roles, men generally attribute more importance to work and income-related domains compared to women (Statistisches Bundesamt, 2016). These findings directly implicate that future research that investigates the consequences of childbirth needs to take into account that men and women can be quite differently affected by the event, specifically when looking at different domains.

In addition to looking at the male versus female subgroups, the present analyses examined the course of satisfaction judgments for women as a function of their employment

status (employed all the time, unemployed all the time, changing employment status after childbirth). It is interesting to note that for employed women, we observed very stable patterns of satisfaction judgments that were, if at all, rather little affected by childbirth. Thus, employed women showed a similar pattern as men. This points to the possibility that the differential patterns observed for women versus men could be mainly driven by the employment status. Being employed may render childbirth as less important because individuals spend a considerable amount of time away from the child after birth - and one may also speculate that anticipation effects are less likely due to a considerable focus on the job. In line with this latter speculation, anticipation effects were (descriptively) only observed for unemployed women, but not for women who were constantly employed. When looking at the three subgroups and at the various domains, it is interesting to note that the reversed u-shaped course is hardly detectable for any of these subgroups. Admittedly, due to our selection criteria, these subgroups reflect a comparably small *N* (*N* = 298).

One may speculate that the typical reversed u-shaped function is a pattern obtained on average, which is observed when all subgroups are included - but that this pattern may only hold for a rather small subset of the participants. In the extreme case, the function obtained for the overall sample may not be reflected in any subgroup. Imagine, for example, that Subgroup A would show strong anticipation effects (i.e., these individuals are looking happily forward to becoming parents and show no decline after the event; that is, their anticipation was correct). In contrast, Subgroup B would show no anticipation (perhaps not even planning on becoming parents), but after childbirth, these individuals would show a strong decline in their life satisfaction. When combining Subgroups A and B, one would obtain the typical anticipation-adaptation pattern, although no subgroup would actually reflect this pattern. Note that this

complication may point to a potentially very crucial, and often overlooked issue in research that has accumulated evidence in line with anticipation and adaptation patterns (Brickman et al., 1978; Frederick & Loewenstein, 1999; Headey & Wearing, 1989; Lykken & Tellegen, 1996).

The stability of the reversed u-shaped course is not only questioned when looking at different subgroups (gender/ employment status), but also when additionally looking at the different facets of domain satisfactions. For women, the reversed u-shaped function was restricted to satisfaction with health and satisfaction with job (note that the latter showed a very singular peak in the year of the event). For men, it was only observable for family life satisfaction. All other domains showed different patterns. For some domains, relatively stable decreases (both for men and women in leisure and sleep; for men in household income) and increases (both for men and women in job) in satisfaction after childbirth emerged. Most of these increases and decreases were restricted to or more pronounced in women, see discussion above. Various domain satisfactions showed an increase in the year before the event, most likely reflecting positive developments in partnership reflected in, for example, family life satisfaction and dwelling satisfaction.

Limitations to Our Study and Future Research

As any empirical endeavor, the present fixed effect analyses based on nationally representative and longitudinal data have some limitations. *First*, although our fixed effect analyses account for unobserved time-invariant variances, they cannot completely eliminate possible biases of time-variant variables (e.g., social support, varying coping styles, etc.). In this respect, including the common control variables in our regression analyses may not be sufficient, and may only constitute a first step.

Second, the available data only allowed us to determine the year of the event, but not the exact date of the event. The more exact the determination of the life event, the more reliable the data. For example, Frijters et al. (2011) showed that using quarterly instead of yearly data improved the reliability of the findings. With such additional data sources, analyses could detect more short-term changes in life satisfaction and domain satisfactions.

Third, our analyses focused on the transition into parenthood. We readily admit that the definition of childbirth in our study is not global. For instance, we were not able to include any information about miscarriages or stillbirths, as well as adoptions, which are likely to differ from a natural birth (e.g., adopted children are often not babies, and the process of becoming parents strongly differs). Our data did not allow us to distinguish between voluntary or involuntary pregnancy, which might also affect how parents react to their transition into parenthood (in this respect, see the above outlined example with Subgroups A and B). Moreover, we followed parents' courses of life satisfaction with one child only, and thus systematically excluded families which decided to have more than one child. The restriction is unlikely to affect satisfaction judgments in the years prior to childbirth and in the year of childbirth. However, in the long run, families deciding to have more children drop out of our analyses.

Fourth, our analyses based on females with different employment status only paints a rough picture of employment reality in Germany. This holds particularly for the changing employment group that comprised all women working before birth and stopping work after birth. Future research should also consider changes from full-time to part-time employment after birth because women in particular tend to stop working full-time after childbirth and enter part-time employment after parental leave in Germany (Statistisches Bundesamt, 2009). Moreover, sample

size in the changing employment group was relatively small, in some years the considered *N* was smaller than 15 (see Table A5).

Finally, the present study did not include psychological variables that could possibly moderate the relationship between childbirth and individuals' satisfaction judgments. In this respect, future research needs to tackle such questions as how individuals cope with the new challenges related with childbirth, or whether individual differences in social values or motives about why and when to become pregnant play a moderating role.

Outlook

Taken together, the present findings suggest that childbirth has quite *dynamic* effects and significantly influences judgments of overall life satisfaction as well as satisfaction with specific domains. Thus, in line with prior research, the results render childbirth as a critical life event with lag and lead effects (Clark et al., 2008; Luhmann et al., 2012). At the same time, however, the reversed u-shaped adaptation patterns in satisfaction judgments seem more fragile than perhaps often assumed. Dependent on which subgroup is looked at, and dependent on which judgmental domain is investigated, the reversed u-shaped pattern is observable or not. This suggests that it is crucial to keep a differentiated view on different facets of subjective well-being and not "to tar all with the same brush."

Although focusing on childbirth as the crucial life event, the present study also holds some messages for the investigation of how other life events influence individuals' subjective well-being. In this respect, one important question pertains to whether individuals adapt to (new) conditions that are elicited by the event in question, in particular, as such adaptation has often been treated as evidence for set point theories. Whereas adaptation has been observed for some events (e.g., marriage; Lucas et al., 2003), mixed findings have been reported for other events

(e.g., divorce; Clark et al., 2008; Lucas, 2005), or consistent absence of complete adaptation (e.g., unemployment; Clark & Georgellis, 2013; Lucas et al., 2004). The present findings further add to the mixed pattern that question the overall applicability of set point theories (e.g., Diener et al., 2006; Headey, 2010). The observed courses of satisfaction judgments over time that summarize either many subgroups or many judgmental domains may sometimes lead one astray. As in the present case with childbirth, such summaries may provide a picture that is far less likely for any of the included subgroups - if this holds true, more scrutinized analyses are necessary not only for the childbirth event, but also for other critical life events that influence individuals' subjective well-being.

References

Armenta, C., Bao, K. J., Lyubomirsky, S., & Sheldon, K. M. (2014). Is lasting change possible? Lessons from the hedonic adaptation prevention model. In K. M. Sheldon & R. E. Lucas (Eds.), *Stability of happiness. Theories and evidences on whether happiness can change* (pp. 57–71). London, UK, Waltham, MA, San Diego, CA: Elsevier Academic Press.

Baumeister, R. F. (1991). *Meanings of life*. New York, NY: Guilford Press.

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, *5*, 323–370. doi: 10.1037//1089-2680.5.4.323

Bernardi, L., Bollmann, G., Potarca, G., & Rossier, J. (2017). Multidimensionality of well-being and spillover effects across life domains: How do parenthood and personality affect changes in domain-specific satisfaction? *Research in Human Development*, *14*, 26–51. doi: 10.1080/15427609.2016.1268893

Boswell, W. R., Boudreau, J. W., & Tichy, J. (2005). The relationship between employee job change and job satisfaction: The honeymoon-hangover effect. *Journal of Applied Psychology*, *90*, 882–892. doi: 10.1037/0021-9010.90.5.882

Brickman, P., & Campbell, D. T. (1971). Hedonic relativism and planning the good society. In M. H. Apley (Ed.), *Hedonic relativism and planning the good society. Adaptation-level theory: A symposium.* New York, NY: Academic Press.

Brickman, P., Coates, D., & Janoff-Bulman, R. (1978). Lottery winners and accident victims: Is happiness relative? *Journal of Personality and Social Psychology*, *36*, 917–927. doi: 10.1037/0022-3514.36.8.917

Cinamon, R. G., & Rich, Y. (2002). Gender differences in the importance of work and family roles: Implications for work-family conflict. *Sex Roles, 47,* 531–541. doi: 10.1023/A:1022021804846

Clark, A. E. (2003). Unemployment as a social norm: Psychological evidence from panel data. *Journal of Labor Economics, 21*, 323–351.

Clark, A. E., Diener, E., Georgellis, Y., & Lucas, R. E. (2008). Lags and leads in life satisfaction: A test of the baseline hypothesis. *The Economic Journal, 118,* F222–F243. doi: 10.1111/j.1468-0297.2008.02150.x

Clark, A. E., & Georgellis, Y. (2013). Back to baseline in Britain: Adaptation in the British Household Panel Survey. *Economica, 80*, 496–512. doi: 10.1111/ecca.12007

Clark, A. E., Georgellis, Y., & Sanfey, P. (2001). Scarring: The psychological impact of past employment. *Economica, 68,* 221–241. doi: 10.1111/1468-0335.00243

Costa, P. T., & McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology, 38,* 668–678. doi: 10.1037/0022-3514.38.4.668

DeNeve, K. M., & Copper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin, 124*, 197–229. doi: 10.1037/0033-2909.124.2.197

Diener, E. (2013). The remarkable changes in the science of subjective well-being. *Perspectives on Psychological Science, 8*, 663–666. doi: 10.1177/1745691613507583

Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? *Social Indicators Research, 57,* 119–169. doi: 10.1023/A:1014411319119

Diener, E., Lucas, R. E., & Scollon, C. N. (2006). Beyond the hedonic treadmill: Revising the adaptation theory of well-being. *American Psychologist*, *61*, 305–314. doi: 10.1037/0003-066X.61.4.305

Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology*, *54*(1), 403–425. doi: 10.1146/annurev.psych.54.101601.145056

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin*, *125*, 276–302. doi: 10.1037/0033-2909.125.2.276

Dolan, P., Peasgood, T., & White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology*, *29*, 94–122. doi: 10.1016/j.joep.2007.09.001

Doss, B. D., Rhoades, G. K., Stanley, S. M., & Markman, H. J. (2009). The effect of the transition to parenthood on relationship quality: An 8-year prospective study. *Journal of Personality and Social Psychology*, *96*, 601–619. doi: 10.1037/a0013969

Dunn, E. W., Aknin, L. B., & Norton, M. I. (2008). Spending money on others promotes happiness. *Science*, *319*, 1687–1688. doi: 10.1126/science.1152864

Dyrdal, G. M., & Lucas, R. E. (2013). Reaction and adaptation to the birth of a child: A couple-level analysis. *Developmental Psychology*, *49*, 749–761. doi: 10.1037/a0028335

Easterlin, R. A. (2005). Building a better theory of well-being. In L. Bruni & P. L. Porta (Eds.), *Economics and happiness. Framing the analysis* (pp. 29–64). Oxford, UK: Oxford University Press. doi: 10.1093/0199286280.003.0002

European Commission. (2006). *The demographic future of Europe: From challenge to opportunity*. Luxembourg: Office for Official Publications of the European Communities.

European Commission. (2009). *The provision of childcare services: A comparative review of 30 European countries*. Luxembourg: Office for Official Publications of the European Communities.

Frederick, S., & Loewenstein, G. (1999). Hedonic adaptation. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 302–329). New York, NY: Russell Sage Foundation.

Frijters, P., Johnston, D. W., & Shields, M. A. (2011). Life satisfaction dynamics with quarterly life event data. *Scandinavian Journal of Economics*, *113*, 190–211. doi: 10.1111/j.1467-9442.2010.01638.x

Georgellis, Y., Lange, T., & Tabvuma, V. (2012). The impact of life events on job satisfaction. *Journal of Vocational Behavior*, *80*, 464–473. doi: 10.1016/j.jvb.2011.12.005

Hansen, T., Slagsvold, B., & Moum, T. (2009). Childlessness and psychological well-being in midlife and old age: An examination of parental status effects across a range of outcomes. *Social Indicators Research, 94*, 343–362. doi: 10.1007/s11205-008-9426-1

Hayes, N., & Joseph, S. (2003). Big 5 correlates of three measures of subjective well-being. *Personality and Individual Differences*, *34*, 723–727. doi: 10.1016/S0191-8869(02)00057-0

Headey, B. (2006). Subjective well-being: Revisions to dynamic equilibrium theory using national panel data and panel regression methods. *Social Indicators Research, 79*, 369–403. doi: 10.1007/s11205-005-5381-2

Headey, B. (2010). The set point theory of well-being has serious flaws: On the eve of a scientific revolution? *Social Indicators Research, 97*, 7–21. doi: 10.1007/s11205-009-9559-x

Headey, B., & Wearing, A. (1989). Personality, life events, and subjective well-being: Towards a dynamic equilibrium model. *Journal of Personality and Social Psychology, 57,* 731–739. doi: 10.1037/0022-3514.57.4.731

Laflamme, D., Pomerleau, A., & Malcuit, G. (2002). A comparison of fathers' and mothers' involvement in childcare and stimulation behaviors during free-play with their infants at 9 and 15 months. *Sex Roles*, *47,* 507–518. doi: 10.1023/A:1022069720776

Lawrence, E., Cobb, R. J., Rothman, A. D., Rothman, M. T., & Bradbury, T. N. (2008). Marital satisfaction across the transition to parenthood. *Journal of Family Psychology*, *22*, 41–50. doi: 10.1037/0893-3200.22.1.41

Lucas, R. E. (2005). Time does not heal all wounds: A longitudinal study of reaction and adaptation to divorce. *Psychological Science, 16,* 945–950. doi: 10.1111/j.1467-9280.2005.01642.x

Lucas, R. E. (2007a). Long-term disability is associated with lasting changes in subjective well-being: Evidence from two nationally representative longitudinal studies. *Journal of Personality and Social Psychology*, *92,* 717–730. doi: 10.1037/0022-3514.92.4.717

Lucas, R. E. (2007b). Adaptation and the set-point model of subjective well-being: Does happiness change after major life events? *Current Directions in Psychological Science, 16,* 75–79. doi: 10.1111/j.1467-8721.2007.00479.x

Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Reexamining adaptation and the set point model of happiness: Reactions to changes in marital status. *Journal of Personality and Social Psychology*, *84,* 527–539. doi: 10.1037/0022-3514.84.3.527

Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2004). Unemployment alters the set point for life satisfaction. *Psychological Science, 15,* 8–13. doi: 10.1111/j.0963-7214.2004.01501002.x

Luhmann, M., Hofmann, W., Eid, M., & Lucas, R. E. (2012). Subjective well-being and adaptation to life events: A meta-analysis. *Journal of Personality and Social Psychology, 102,* 592–615. doi: 10.1037/a0025948

Lykken, D., & Tellegen, A. (1996). Happiness is a stochastic phenomenon. *Psychological Science, 7,* 186–189. doi: 10.1111/j.1467-9280.1996.tb00355.x

Lyubomirsky, S. (2001). Why are some people happier than others? The role of cognitive and motivational processes in well-being. *American Psychologist, 56,* 239–249. doi: 10.1037//0003-066X.56.3.239

Mancini, A. D., Bonanno, G. A., & Clark, A. E. (2011). Stepping Off the Hedonic Treadmill. *Journal of Individual Differences, 32,* 144–152. doi: 10.1027/1614-0001/a000047

Margraf, J., Meyer, A. H., & Lavallee, K. L. (2013). Well-being from the knife? Psychological effects of aesthetic surgery. *Clinical Psychological Science, 1,* 239–252. doi: 10.1177/2167702612471660

McDonald, P. (2000). Gender equity in theories of fertility transition. *Population and Development Review, 26,* 427–439. doi: 10.1111/j.1728-4457.2000.00427.x

McLanahan, S., & Adams, J. (1987). Parenthood and psychological well-being. *Annual Review of Sociology, 13,* 237–257. doi: 10.1146/annurev.so.13.080187.001321

Milkie, M. A., Bianchi, S. M., Mattingly, M. J., & Robinson, J. P. (2002). Gendered division of childrearing: Ideals, realities, and the relationship to parental well-being. *Sex Roles, 47,* 21–38. doi: 10.1023/A:1020627602889

Myers, D. G. (1999). Close relationships and quality of life. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 374–391). New York, NY: Russell Sage Foundation.

Myrskyla, M., & Margolis, R. (2014). Happiness: Before and after the kids. *Demography*, *51*, 1843–1866. doi: 10.1007/s13524-014-0321-x

Nes, R. B., & Roysamb, E. (2015). The heritability of subjective well-being: Review and meta-analysis. In M. Pluess (Ed.), *The genetics of psychological well-being. The role of heritability and genetics in positive psychology* (pp. 75–96). Oxford, UK: Oxford University Press.

Penedo, F., & Dahn, J. (2005). Exercise and well-being: A review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry*, *18*, 189–193. doi: 10.1097/00001504-200503000-00013

Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review*, *5*, 296–320. doi: 10.1207/S15327957PSPR0504_2

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141–166. doi: 10.1146/annurev.psych.52.1.141

Sheldon, K. M., & Lucas, R. E. (Eds.). (2014). *Stability of happiness: Theories and evidences on whether happiness can change*. London, UK, Waltham, MA, San Diego, CA: Elsevier Academic Press.

Statistisches Bundesamt. (2009). Im Blickpunkt: Jugend und Familie in Europa. Retrieved from https://www.destatis.de/DE/Publikationen/Thematisch/Internationales/IBJugendFamilieEuropa.pdf?__blob=publicationFile

Statistisches Bundesamt. (2016). Datenreport 2016: Sozialbericht für die Bundesrepublik Deutschland. Retrieved from https://www.destatis.de/DE/Publikationen/Datenreport/Downloads/Datenreport2016.pdf?__blob=publicationFile

Stutzer, A., & Frey, B. S. (2006). Does marriage make people happy, or do happy people get married? *Journal of Socio-Economics*, *35*, 326–347. doi: 10.1016/j.socec.2005.11.043

Umberson, D., Pudrovska, T., & Reczek, C. (2010). Parenthood, childlessness, and well-being: A life course perspective. *Journal of Marriage and the Family*, *72*, 612–629. doi: 10.1111/j.1741-3737.2010.00721.x

Wagner, G. G., Frick, J. R., & Schupp, J. (2007). The German Socio-Economic Panel Study (SOEP): Scope, evolution and enhancements. *Schmollers Jahrbuch*, *127*, 139–169. doi: 10.2139/ssrn.1028709

Wengle, H. (1986). The psychology of cosmetic surgery: A critical overview of the literature 1960-1982. Part I. *Annals of plastic surgery*, *16*, 435–443. doi: 10.1097/00000637-198605000-00011

Wooldridge, J. M. (2015). *Introductory econometrics: A modern approach.* Mason, Ohio: South-Western Cengage Learning.

Yap, S. C. Y., Anusic, I., & Lucas, R. E. (2012). Does personality moderate reaction and adaptation to major life events? Evidence from the British Household Panel Survey. *Journal of Research in Personality*, *46*, 477–488. doi: 10.1016/j.jrp.2012.05.005

Appendix

Additional Tables and Figures of Subsample Analyses

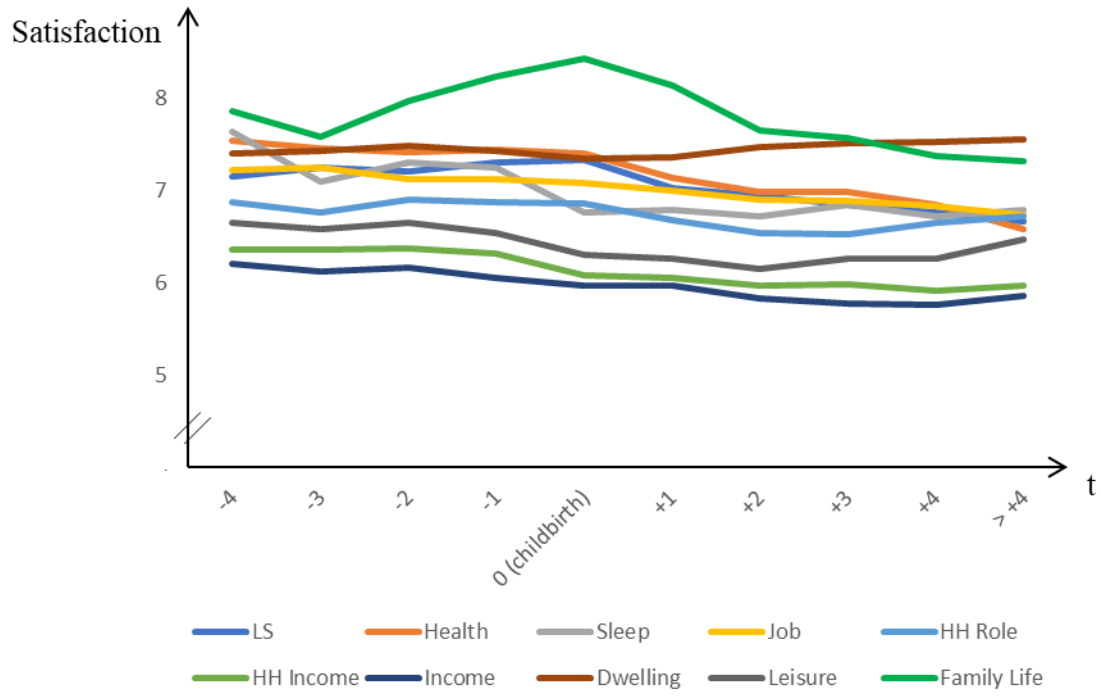


Figure A1. Male sample - Means for life satisfaction and domain satisfactions before and after childbirth. *Note*. LS = life satisfaction; HH = household. Socio-Economic Panel, data from 1992 to 2013.

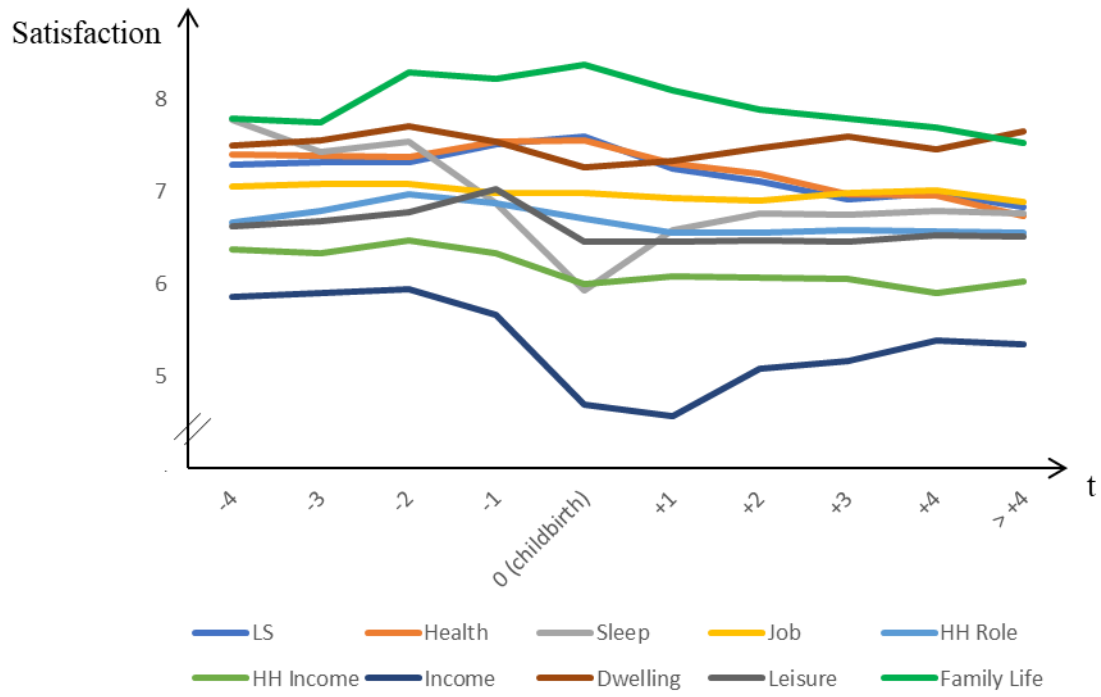


Figure A2. Female sample - Means for life satisfaction and domain satisfactions before and after childbirth. *Note*. LS = life satisfaction; HH = household. Socio-Economic Panel, data from 1992 to 2013.

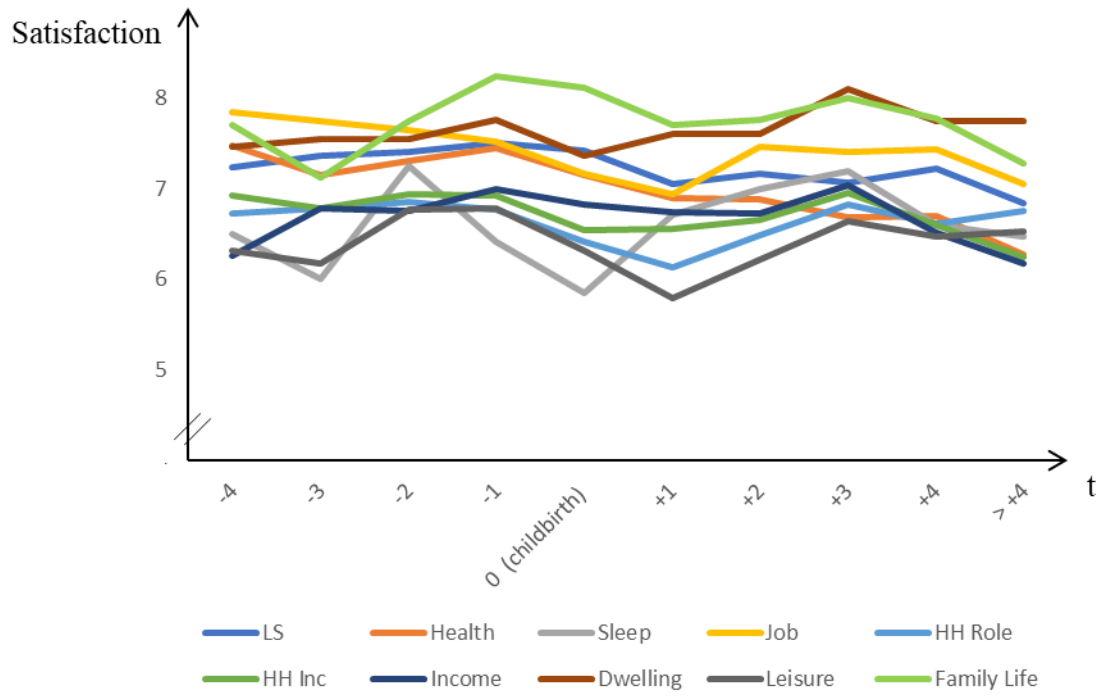


Figure A3. Female employed sample - Means for life satisfaction and domain satisfactions before and after childbirth. *Note*. LS = life satisfaction; HH = household. Socio-Economic Panel, data from 1992 to 2013.

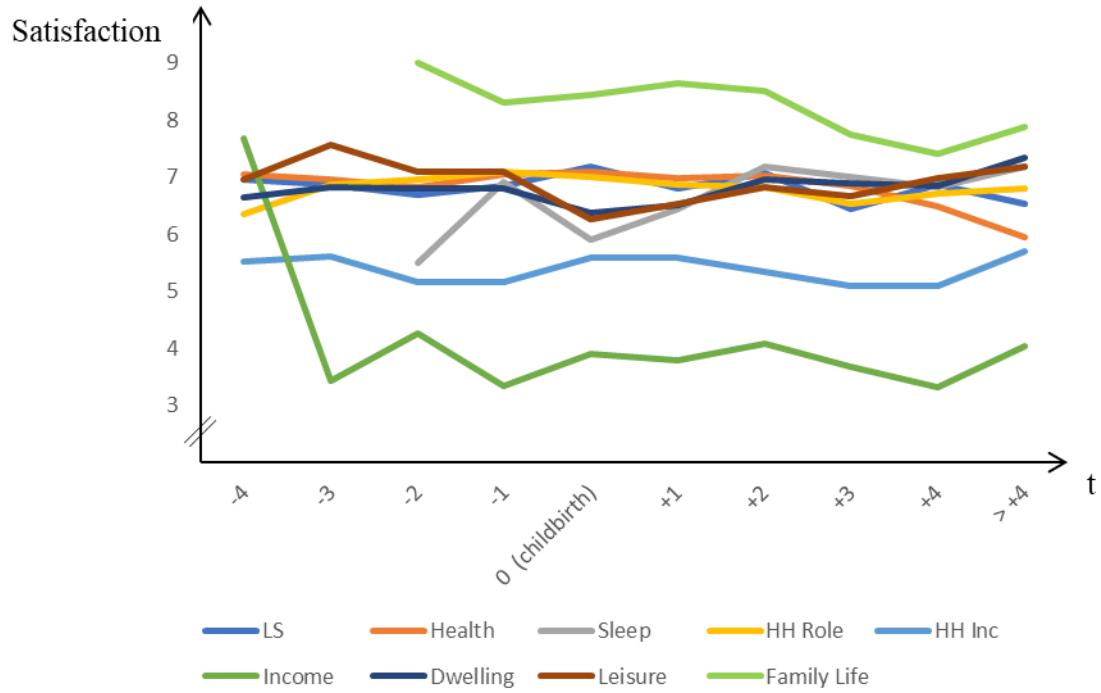


Figure A4. Female unemployed sample - Means for life satisfaction and domain satisfactions before and after childbirth. *Note*. LS = life satisfaction; HH = household. Socio-Economic Panel, data from 1992 to 2013.

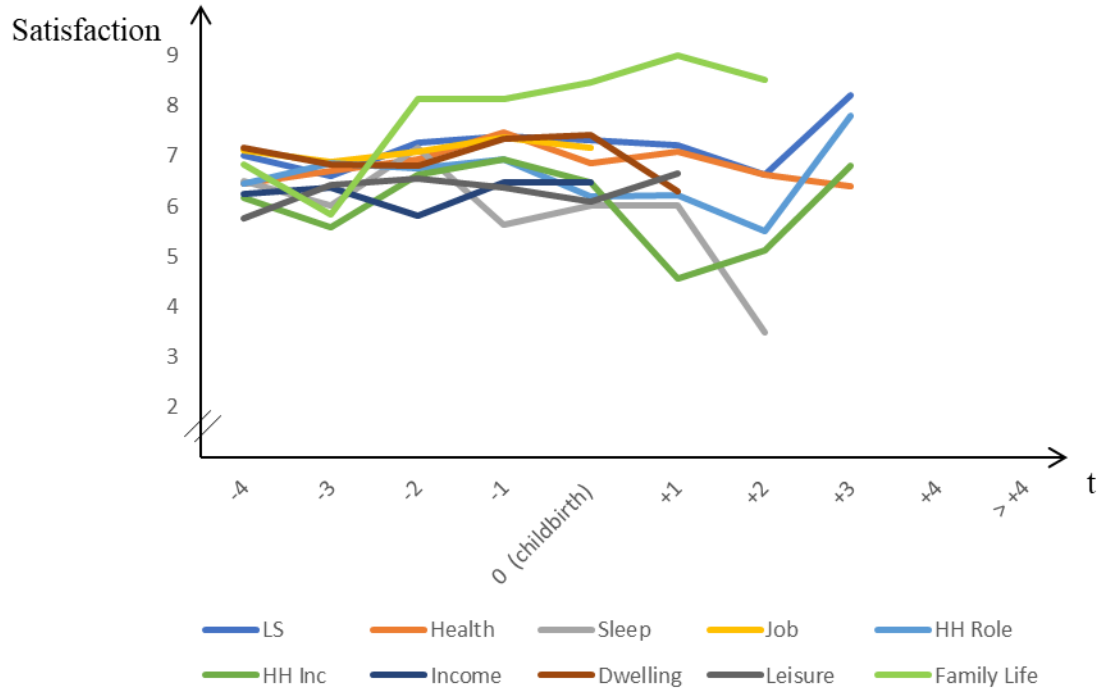


Figure A5. Female changing employed sample - Means for life satisfaction and domain satisfactions before and after childbirth. *Note*. LS = life satisfaction; HH = household. Socio-Economic Panel, data from 1992 to 2013.

Table A1

Male Sample - Means and Standard Deviations in Parentheses for Life Satisfaction and Domain Satisfactions Before and After Childbirth

Years before and after childbirth	LS	Health	Sleep	Job	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	7.16 (1.63)	7.55 (1.91)	7.64 (1.63)	7.22 (2.12)	6.88 (1.98)	6.36 (2.21)	6.21 (2.25)	7.41 (2.03)	6.66 (2.18)	7.86 (1.85)
-3	7.25 (1.62)	7.46 (2.04)	7.10 (2.33)	7.25 (1.98)	6.76 (2.02)	6.36 (2.20)	6.13 (2.47)	7.44 (2.02)	6.59 (2.26)	7.58 (2.14)
-2	7.21 (1.61)	7.42 (1.91)	7.31 (1.77)	7.13 (2.02)	6.91 (2.03)	6.37 (2.21)	6.17 (2.37)	7.49 (1.99)	6.65 (2.13)	7.98 (1.75)
-1	7.31 (1.63)	7.45 (1.95)	7.25 (2.12)	7.13 (2.05)	6.87 (2.00)	6.32 (2.22)	6.05 (2.39)	7.43 (2.11)	6.54 (2.19)	8.24 (1.72)
0 (childbirth)	7.34 (1.57)	7.40 (1.84)	6.77 (2.04)	7.09 (2.07)	6.86 (1.97)	6.08 (2.22)	5.97 (2.42)	7.35 (2.08)	6.31 (2.19)	8.43 (1.61)
+1	7.03 (1.64)	7.14 (1.94)	6.79 (1.98)	7.00 (1.98)	6.68 (2.03)	6.06 (2.13)	5.97 (2.43)	7.37 (1.98)	6.27 (2.19)	8.14 (1.69)
+2	6.95 (1.72)	6.99 (1.98)	6.73 (2.01)	6.91 (2.05)	6.54 (2.04)	5.97 (2.22)	5.83 (2.42)	7.47 (1.96)	6.15 (2.20)	7.66 (1.95)
+3	6.85 (1.72)	6.99 (1.95)	6.85 (2.16)	6.89 (2.00)	6.53 (1.97)	5.98 (2.20)	5.78 (2.35)	7.51 (1.98)	6.27 (2.25)	7.57 (2.14)
+4	6.76 (1.78)	6.85 (2.05)	6.72 (2.29)	6.83 (2.18)	6.65 (1.96)	5.92 (2.17)	5.76 (2.36)	7.53 (1.89)	6.26 (2.27)	7.38 (2.27)
> +4	6.67 (1.74)	6.59 (2.11)	6.79 (2.19)	6.74 (2.07)	6.72 (1.92)	5.97 (2.24)	5.86 (2.40)	7.56 (1.86)	6.48 (2.19)	7.32 (2.24)

Note. LS = life satisfaction; HH = household; Inc = income. Socio-Economic Panel, data from 1992 to 2013.

Table A2

Female Sample - Means and Standard Deviations in Parentheses for Life Satisfaction and Domain Satisfactions Before and After Childbirth

Years before and after childbirth	LS	Health	Sleep	Job	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	7.30 (1.63)	7.41 (2.02)	7.78 (2.04)	7.06 (2.12)	6.67 (2.00)	6.38 (2.26)	5.86 (2.41)	7.50 (2.18)	6.63 (2.15)	7.80 (2.10)
-3	7.32 (1.62)	7.39 (1.92)	7.44 (1.95)	7.09 (2.07)	6.80 (1.92)	6.33 (2.26)	5.90 (2.37)	7.56 (2.15)	6.68 (2.15)	7.76 (1.77)
-2	7.32 (1.61)	7.38 (1.91)	7.54 (2.06)	7.09 (2.04)	6.98 (1.86)	6.48 (2.24)	5.94 (2.58)	7.71 (2.06)	6.78 (2.18)	8.30 (1.60)
-1	7.52 (1.60)	7.54 (1.91)	6.88 (2.21)	6.99 (2.06)	6.88 (1.83)	6.33 (2.29)	5.66 (2.58)	7.55 (2.05)	7.03 (2.07)	8.23 (1.65)
0 (childbirth)	7.60 (1.57)	7.56 (1.90)	5.93 (2.52)	6.99 (2.18)	6.71 (1.91)	6.00 (2.31)	4.69 (2.72)	7.27 (2.27)	6.46 (2.24)	8.38 (1.61)
+1	7.25 (1.63)	7.31 (1.97)	6.59 (2.20)	6.93 (2.13)	6.56 (1.85)	6.09 (2.22)	4.56 (2.83)	7.34 (2.25)	6.46 (2.20)	8.10 (1.71)
+2	7.12 (1.60)	7.20 (1.93)	6.76 (2.04)	6.91 (2.06)	6.56 (1.89)	6.07 (2.19)	5.08 (2.74)	7.48 (2.14)	6.48 (2.20)	7.89 (1.72)
+3	6.92 (1.72)	6.97 (2.02)	6.75 (2.14)	6.99 (2.18)	6.59 (1.78)	6.06 (2.25)	5.17 (2.72)	7.60 (2.14)	6.46 (2.18)	7.80 (1.89)
+4	6.99 (1.66)	6.96 (2.03)	6.80 (2.07)	7.01 (2.18)	6.57 (1.86)	5.90 (2.41)	5.39 (2.62)	7.46 (2.18)	6.53 (2.24)	7.70 (1.90)
> +4	6.83 (1.71)	6.74 (2.09)	6.76 (2.22)	6.89 (2.12)	6.55 (1.88)	6.03 (2.31)	5.35 (2.49)	7.65 (1.89)	6.51 (2.18)	7.53 (2.08)

Note. LS = life satisfaction; HH = household; Inc = income. Socio-Economic Panel, data from 1992 to 2013.

Table A3

Female Employed Sample - Means and Standard Deviations in Parentheses for Life Satisfaction and Domain Satisfactions Before and After Childbirth

Years before and after childbirth	LS	Health	Sleep	Job	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	7.24 (1.50)	7.48 (1.82)	6.50 (3.08)†	7.85 (1.57)	6.73 (2.04)	6.92 (2.06)	6.26 (1.71)	7.47 (2.04)	6.32 (2.41)	7.70 (2.45)†
-3	7.36 (1.59)	7.15 (1.80)	6.00 (1.89)	7.74 (1.48)	6.78 (1.99)	6.79 (2.28)	6.79 (2.28)	7.55 (2.12)	6.18 (2.32)	7.13 (2.17)
-2	7.40 (1.36)	7.31 (1.69)	7.25 (2.02)	7.65 (1.80)	6.85 (2.07)	6.94 (1.85)	6.75 (2.05)	7.55 (1.87)	6.77 (2.12)	7.74 (1.85)
-1	7.50 (1.57)	7.45 (2.09)	6.42 (2.39)	7.52 (1.61)	6.77 (1.70)	6.92 (1.91)	7.00 (1.74)	7.76 (1.80)	6.79 (2.06)	8.24 (1.54)
0 (childbirth)	7.42 (1.34)	7.15 (2.00)	5.85 (2.22)	7.16 (1.85)	6.42 (1.85)	6.55 (1.94)	6.82 (1.60)	7.37 (2.24)	6.32 (2.20)	8.11 (1.35)
+1	7.05 (1.70)	6.90 (1.95)	6.71 (2.42)	6.94 (1.97)	6.14 (1.70)	6.56 (2.07)	6.74 (1.95)	7.61 (2.05)	5.79 (2.35)	7.70 (1.70)
+2	7.16 (1.54)	6.89 (2.01)	7.00 (1.83)	7.47 (1.77)	6.49 (1.92)	6.65 (1.95)	6.73 (2.09)	7.61 (2.15)	6.22 (2.03)	7.76 (1.54)
+3	7.07 (1.68)	6.68 (1.96)	7.20 (1.98)	7.41 (1.64)	6.82 (1.85)	6.95 (2.10)	7.04 (2.19)	8.10 (2.01)	6.64 (2.00)	8.00 (1.49)
+4	7.22 (1.61)	6.70 (2.01)	6.60 (2.12)	7.44 (1.77)	6.62 (1.80)	6.60 (2.37)	6.52 (2.29)	7.75 (2.12)	6.47 (2.17)	7.78 (1.99)
> +4	6.84 (1.81)	6.28 (2.17)	6.47 (2.16)	7.05 (1.87)	6.76 (1.80)	6.25 (2.27)	6.17 (2.87)	7.74 (1.99)	6.53 (2.19)	7.28 (2.24)

Note. LS = life satisfaction; HH = household; Inc = income. Socio-Economic Panel, data from 1992 to 2013. † = $N < 15$.

Table A4

Female Unemployed Sample - Means and Standard Deviations in Parentheses for Life Satisfaction and Domain Satisfactions Before and After Childbirth

Years before and after childbirth	LS	Health	Sleep	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	6.96 (1.60)	7.04 (1.69)	---	6.35 (1.62)	5.52 (2.47)	7.67 (0.58)†	6.65 (2.67)	6.95 (1.65)	---
-3	6.86 (1.69)	6.95 (2.08)	---	6.87 (1.87)	5.60 (2.41)	3.43 (3.55)†	6.83 (2.54)	7.56 (1.77)	---
-2	6.68 (1.89)	6.82 (2.35)	5.50 (2.12)†	6.96 (2.05)	5.15 (2.33)	4.27 (3.90)	6.80 (2.54)	7.09 (2.09)	9.00 (1.15)†
-1	6.85 (2.03)	7.05 (2.25)	6.91 (2.12)†	7.09 (2.02)	5.16 (2.57)	3.33 (2.75)	6.80 (2.05)	7.09 (2.09)	8.31 (1.49)
0 (childbirth)	7.18 (1.86)	7.09 (2.38)	5.89 (3.25)	7.00 (2.10)	5.58 (2.58)	3.91 (2.95)	6.38 (2.75)	6.27 (2.43)	8.43 (2.31)
+1	6.79 (2.06)	6.99 (2.54)	6.44 (3.09)†	6.87 (1.92)	5.58 (2.47)	3.79 (3.00)	6.50 (2.68)	6.53 (2.33)	8.65 (1.58)
+2	7.06 (1.69)	7.03 (2.10)	7.18 (2.71)†	6.82 (2.08)	5.35 (2.49)	4.08 (2.68)	6.96 (2.31)	6.82 (2.33)	8.50 (1.51)†
+3	6.44 (1.88)	6.84 (2.26)	7.00 (1.76)†	6.54 (1.74)	5.10 (2.39)	3.67 (3.33)	6.90 (2.33)	6.66 (2.01)	7.74 (2.38)
+4	6.86 (1.90)	6.48 (2.20)	6.83 (1.90)†	6.72 (2.11)	5.10 (2.20)	3.32 (2.40)	6.84 (2.73)	6.98 (1.90)	7.40 (2.59)
> +4	6.53 (1.87)	5.94 (2.50)	7.19 (2.04)	6.81 (1.79)	5.69 (2.49)	4.03 (2.56)	7.34 (1.82)	7.18 (1.93)	7.88 (2.07)

Note. LS = life satisfaction; HH = household; Inc = income. Job satisfaction only assessed for employed individuals. Socio-Economic Panel, data from 1992 to 2013. † = $N < 15$.

Table A5

Female Changing Employed Sample - Means and Standard Deviations in Parentheses for Life Satisfaction and Domain Satisfactions Before and After Childbirth

Years before and after childbirth	LS	Health	Sleep	Job	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	7.00 (1.78)	6.44 (2.38)	6.50 (3.08)†	7.11 (2.22)	6.44 (1.97)	6.17 (1.89)	6.25 (1.75)†	7.17 (2.60)	5.76 (2.86)	6.83 (2.86)†
-3	6.59 (2.09)	6.71 (2.02)	6.00 (2.37)†	6.88 (2.00)	6.86 (1.83)†	5.59 (2.15)	6.38 (1.92)†	6.82 (2.74)	6.41 (2.37)	5.83 (2.48)†
-2	7.25 (1.59)	6.92 (2.15)	7.17 (1.72)†	7.08 (2.32)	6.75 (1.53)	6.63 (1.69)	5.82 (1.94)†	6.79 (2.06)	6.55 (2.28)	8.13 (2.13)†
-1	7.40 (1.85)	7.46 (2.23)	5.63 (2.56)†	7.35 (1.65)	6.93 (2.02)	6.94 (1.68)	6.46 (1.94)†	7.34 (1.89)	6.37 (2.60)	8.13 (2.30)†
0 (childbirth)	7.31 (1.49)	6.86 (2.11)	6.00 (2.18)†	7.17 (2.05)	6.19 (2.20)	6.47 (1.61)	6.47 (1.36)	7.42 (2.01)	6.08 (2.16)	8.45 (1.29)†
+1	7.21 (1.58)†	7.07 (2.09)†	6.00 (2.83)†	---	6.21 (1.67)†	4.57 (2.14)†	1.83 (2.23)†	6.29 (2.70)†	6.64 (2.27)	9.00 (1.73)†
+2	6.63 (1.69)†	6.63 (2.39)†	3.50 (2.12)†	---	5.50 (2.27)†	5.13 (1.25)†	---	---	---	8.50 (0.71)†
+3	8.20 (1.48)†	6.40 (2.07)†	---	---	7.80 (1.79)†	6.80 (1.92)†	---	---	---	---
+4	---	---	---	---	---	---	---	---	---	---
> +4	---	---	---	---	---	---	---	---	---	---

Note. LS = life satisfaction; HH = household; Inc = income. Socio-Economic Panel, data from 1992 to 2013. † = $N < 15$.

Table A6

Male Sample - Lag and Lead Effects of Childbirth on Life Satisfaction and Domain Satisfactions

Years	LS	Health	Sleep	Job	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	-.043	.070	.378	.065	.133	.118	-.170	.096	.031	.252
-3	.071	.051	.076	.126	.146	.061	-.277	**.159***	.084	.035
-2	.006	.016	.203	.029	**.268****	.068	-.250	**.207***	.103	.392
-1	**.132***	.083	.189	.089	.174	-.012	-.296	.146	.019	.646
0 (childbirth)	**.198****	.113	-.304	.088	**.188***	**-.221****	**-.354***	.048	**-.188***	**.748***
+1	-.083	-.051	-.107	.128	.073	**-.222****	**-.363***	.028	**-.224****	.505
+2	-.101	-.086	-.177	.006	-.083	**-.327*****	**-.451***	.074	**-.326*****	.097
+3	-.084	-.019	-.028	.146	.013	-.168	-.344	.184	**-.228***	.141
+4	-.097	.017	-.106	.114	.108	**-.242***	-.384	.148	**-.242***	-.052
> +4	**-.172***	.052	---	.149	.118	**-.292****	-.387	.138	-.124	-.055
Controls										
Age	**-.022*****	**-.067*****	**-.053*****	**-.042*****	**.018*****	**-.009*****	**.045*****	**.014*****	**.013*****	-.001
Education	**-.051*****	-.008	.031	**-.029***	-.004	**-.034****	.008	**-.044*****	-.008	-.001
Marital status (ref = married)										
Married, living sep	**-.495*****	-.013	-.316	**.223****	-.098	**-.189****	-.023	**-.226****	.035	**-1.961*****
Single	-.027	.077	.093	**.118***	-.065	-.045	.038	-.095	**.175****	**-.299****
Divorced	-.034	.047	-.037	.085	.006	-.009	.042	-.102	.077	**-.650*****
Widowed	-.128	-.175	-.514	.111	-.083	**.673*****	**.794****	.092	.269	**-1.846*****
Spouse abroad	-.771	.165	---	-.133	-.391	-.030	.125	-.654	**-.704****	---
SS, living together	**-.674*****	-.175	-.213	.346	-.118	-.029	.034	-.341	-.117	.376
SS, living sep	**.427*****	-.143	.109	**-.652*****	**1.528*****	**1.706*****	**2.068*****	**.239****	**1.625*****	**-.747*****
Log income	**.343*****	**.120*****	**.131****	**.358*****	**.128*****	**1.170*****	**.837*****	**.266*****	**.097*****	**.243****
Employment status (ref = full-time job)										
Part-time job	**-.172*****	**-.105***	-.078	**-.393*****	-.045	**-.464*****	**-.637*****	-.060	**.592*****	.088
Apprenticeship	-.006	-.056	.173	.061	-.091	**-.347*****	**-.404*****	**.106***	**.563*****	.071
Minor employment	**-.255*****	-.027	.060	**-.747*****	**-.196****	**-.646*****	**-1.158*****	**-.101***	**.792*****	.041
Unemployment	**-.408*****	**-.113*****	.080	**-1.762*****	**-.159*****	**-.798*****	**-1.536*****	.017	**.990*****	.030

Note. LS = life satisfaction; HH = household; Inc = income; ref = reference; sep = separately; SS = same sex. Socio-Economic Panel, data from 1992 to 2013. *** $p < .001$. ** $p < .01$. * $p < .05$.

Table A7

Female sample - Lag and Lead Effects of Childbirth on Life Satisfaction and Domain Satisfactions

Years	LS	Health	Sleep	Job	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	.003	.062	**1.002***	.035	-.101	.102	.280	.068	-.133	-.336
-3	-.009	.014	.580	-.038	-.038	-.067	**.442***	.115	-.134	-.500
-2	.017	.048	**.724***	-.058	.072	.023	**.413***	**.273****	-.050	-.030
-1	**.229*****	**.257*****	.059	-.061	-.032	-.024	**.434***	.120	.063	-.123
0 (childbirth)	**.511*****	**.327*****	**-.951****	**.657*****	**-.167***	-.006	**.431***	**-.200***	**-1.116*****	-.182
+1	.123	.134	-.186	.170	**-.336*****	.032	-.002	-.182	**-1.042*****	-.511
+2	.011	.080	-.127	.102	**-.307****	.004	.355	-.005	**-.955*****	**-.722***
+3	-.093	-.060	-.220	.187	**-.295****	.019	.368	.126	**-.874*****	**-.732***
+4	.014	.041	-.179	.192	**-.288****	-.173	.385	-.072	**-.694*****	-.686
> +4	-.085	.089	---	.218	**-.353****	-.112	.235	.050	**-.885*****	**-.861***
Controls										
Age	**-.024*****	**-.056*****	**-.058*****	**-.041*****	**.007****	**-.009*****	**.056*****	**.020*****	**.024*****	.002
Education	.003	**.035*****	.031	-.007	.018	**-.024***	**.075***	-.009	**.030****	.015
Marital status (ref = married)										
Married, living sep	**-.207****	.112	.072	**.**065	**.261*****	**-.258*****	.086	.000	**.286*****	**-.986*****
Single	-.042	.023	.086	-.092	-.010	-.085	.136	-.003	**.196*****	**-.229****
Divorced	-.009	.097	.014	-.069	.107	**-.205****	.025	-.010	.098	-.052
Widowed	-.116	.113	-.280	.202	**.232****	**.329****	**.630*****	**.249***	**.376*****	**-2.027*****
Spouse abroad	**.417***	.155	---	.357	.505	-.077	---	-.621	.056	
SS, living together	-.758	-.060	-.062	.021	.388	-.275	**-.762*****	-.619	-.348	-.699
SS, living sep	**---**	---	---	---	---	---	---	---	---	
Log income	**.288*****	**.094*****	.066	**.178*****	-.027	**1.218*****	**.726*****	**.235*****	.030	**.227*****
Employment status (ref = full-time job)										
Part-time job	**-.048***	.029	-.075	**-.112****	**.062***	**-.296*****	**-.481*****	.044	**.583*****	.064
Apprenticeship	-.044	-.066	-.232	**.127***	-.068	**-.406*****	**-.616*****	.058	**.214*****	.181
Minor employment	**-.189*****	.002	-.058	**-.432*****	.006	**-.557*****	**-1.079*****	.028	**.862*****	.080
Unemployment	**-.242*****	-.002	.020	**-1.532*****	-.002	**-.614*****	**-1.831*****	.046	**1.115*****	**.188*****

Note. LS = life satisfaction; HH = household; Inc = income; ref = reference; sep = separately; SS = same sex. Socio-Economic Panel, data from 1992 to 2013. *** $p < .001$. ** $p < .01$. * $p < .05$.

Table A8

Employed Female Sample - Lag and Lead Effects of Childbirth on Life Satisfaction and Domain Satisfactions for Childbirth

Years	LS	Health	Sleep	Job	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	-.087	.235	-.069	.219	-.252	.213	.274	.259	.065	-.776
-3	.024	.012	-1.157	.161	-.153	-.043	.613	.319	-.142	-1.488
-2	.028	.113	.185	-.007	-.103	.039	.273	.409	.195	-.887
-1	.108	.361	-.640	-.042	-.343	-.154	.560	**.473***	.310	-.166
0 (childbirth)	.082	.090	**-1.305***	-.307	**-.687****	-.432	.333	-.096	-.314	-0.709
+1	-.280	-.082	-.456	**-.487***	**-.896*****	-.366	.456	.196	**-.879*****	-1.323
+2	-.196	-.007	-.663	.044	**-.559***	-.322	.228	.162	**-.606***	-1.216
+3	-.137	-.094	.346	.023	-.236	.076	.430	**.691****	-.203	-1.031
+4	-.069	-.060	-.247	.018	**-.697***	-.491	-.189	.059	-.377	-1.221
> +4	-.151	-.013	---	-.147	-.491	-.283	-.215	.236	-.398	-1.475
Controls										
Age	**-.023*****	**-.055*****	**-.057*****	**-.041*****	**.008****	**-.009*****	**.057*****	**.020*****	**.025*****	-.001
Education	.001	**.039*****	.044	-.030	.025	**-.027***	**.064***	-.017	**.028***	.008
Marital status (ref = married)										
Married, living sep	**-.180***	.130	.152	**.**031	**.281*****	**-.225*****	.163	.010	**.316*****	**-.945*****
Single	-.004	.091	.202	-.036	.060	-.095	.192	.026	**.307*****	**-.315****
Divorced	-.005	.096	.029	-.090	**.158***	**-.187***	.025	.012	.125	-.150
Widowed	-.111	.111	-.285	.207	**.209****	**.342****	**.608*****	**.254****	**.371*****	**-2.001*****
Spouse abroad	**.422***	.165	---	.346	.529	-.067	---	-.611	.075	---
SS, living together	**-1.537***	-.188	.094	-.286	**1.222****	**-1.118*****	-.807	-1.374	**-.826***	-.897
SS, living sep	**---**	---	---	---	---	---	---	---	---	---
Log income	**.287*****	**.102*****	.059	**.193*****	-.022	**1.209*****	**.694*****	**.234*****	.036	**.206*****
Employment status (ref = full-time job)										
Part-time job	**-.058****	.033	-.066	**-.135****	**.071***	**-.295*****	**-.502*****	**.056***	**.581*****	**.106***
Apprenticeship	-.006	-.006	-.154	.068	-.018	**-.394*****	**-.544*****	.095	**.313*****	.177
Minor employment	**-.217*****	-.018	-.003	**-.519*****	.005	**-.569*****	**-1.057*****	.051	**.880*****	.084
Unemployment	**-.262*****	-.014	.073	**-1.671*****	-.017	**-.622*****	**-1.753*****	.052	**1.141*****	**.189*****

Note. LS = life satisfaction; HH = household; Inc = income; ref = reference; sep = separately; SS = same sex. Socio-Economic Panel, data from 1992 to 2013. *** $p < .001$. ** $p < .01$. * $p < .05$.

Table A9

Unemployed Female Sample - Lag and Lead Effects of Childbirth on Life Satisfaction and Domain Satisfactions

Years	LS	Health	Sleep	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	.286	**.784***	---	.091	.800	**-1.887***	-.589	-.078	---
-3	.582	**.942***	---	.860	**1.396****	**-2.957*****	-.032	**.795***	---
-2	.532	.707	**-2.187***	**.892***	**.973***	**-2.244****	-.134	-.107	1.683
-1	.453	**.879***	.360	.696	**1.065****	**-2.957*****	.095	.451	.200
0 (childbirth)	**.863****	**.969****	-1.407	**.747***	**1.406****	**-2.107*****	-.671	-.791	.452
+1	**.677***	**1.072****	-.436	.705	**1.511****	**-2.161*****	-.463	-.463	1.078
+2	**.926****	**1.082****	**1.917***	.690	**1.354****	**-1.939****	.188	-.460	.903
+3	.382	**1.070****	.147	.195	**1.059***	**-2.668*****	-.006	-.525	-.206
+4	**.792***	**.995***	-.641	.791	**1.071***	**-3.583*****	-.144	-.114	.044
> +4	**.804***	.949	---	.560	**1.514*****	**-2.878*****	.574	-.273	---
Controls									
Age	**-.023*****	**-.056*****	**-.058*****	**.008*****	**-.009*****	**.057*****	**.020*****	**.025*****	.000
Education	-.001	**.040*****	.050	**.027***	**-.028***	**-.068***	-.017	**.026***	.007
Marital status (ref = married)									
Married, living sep	**-.187****	-.124	.153	**.270*****	**-.234****	.149	.023	**.306*****	**-.967*****
Single	-.049	.071	.203	.050	-.103	**.216***	.015	**.276*****	**-.317****
Divorced	-.009	.096	.051	**.151***	**-.183***	**.077*****	-.006	.091	-.110
Widowed	-.102	.101	-.283	**.232****	**.354****	**.658*****	**.270****	**.400*****	**-1.996*****
Spouse abroad	**.422***	.161	---	.534	-.063	---	-.614	.070	---
SS, living together	-1.569	-.249	.107	**-1.095***	**-1.042****	-.398	**-1.625***	-.585	-.641
SS, living sep	**---**	---	---	---		---	---	---	---
Log income	**.288*****	**.104*****	.061	-.023	**1.208*****	**.695*****	**.228*****	.038	**.206*****
Employment status (ref = full-time job)									
Part-time job	**-.059***	.040	-.062	.073*	**-.301*****	**-.496*****	**.056***	**.586*****	**.097***
Apprenticeship	-.005	.003	-.152	-.008	**-.386*****	**-.546*****	.097	**.316*****	.173
Minor employment	**-.218*****	.020	-.014	-.009	**-.572*****	**-1.061*****	.053	**.879*****	.073
Unemployment	**-.261*****	-.008	.079	-.101	**-.623*****	**-1.751*****	.053	**1.146*****	**.175****

Note. LS = life satisfaction; HH = household; Inc = income; ref = reference; sep = separately; SS = same sex. Socio-Economic Panel, data from 1992 to 2013. *** $p < .001$. ** $p < .01$. * $p < .05$.

Table A10

Female Changing Employment Sample - Lag and Lead Effects of Childbirth on Life Satisfaction and Domain Satisfactions

Years	LS	Health	Sleep	Job	HH Role	HH Inc	Income	Dwelling	Leisure	Family Life
-4	-.171	-.498	**1.543***	-.632	-.279	-.029	-.097	.874	-.124	-1.286
-3	-.649	.017	.576	**-.996***	-.563	-.571	-.152	.147	.199	-2.544
-2	-.064	-.193	**2.166***	-.922	-.464	.450	-.271	.205	-.056	-.342
-1	-.013	.298	.291	**-.818***	-.470	.447	.606	.822	.001	.565
0 (childbirth)	-.140	-.270	.520	**-.980***	**-1.104***	.043	.176	.813	-.324	-.392
+1	.114	.511	**-.059***	-1.306	-.901	-.292	-1.659	.037	-.487	-.476
+2	-.411	.513	**-2.045*****	3.064	-1.309	.529	**-3.009****	.427	-.388	-.701
+3	.828	.566	---	-1.425	.167	2.042	**-1.443***	.547	-.713	-.350
+4	**-.899*****	**1.936*****	---	---	1.331	**-2.077*****	**-3.715*****	-.640	**-1.670*****	---
> +4	-.106	**2.017*****	---	---	**1.406*****	.181	**-2.351****	1.006	-.666	---
Controls										
Age	**-.023*****	**-.056*****	**-.057*****	**-.041*****	**.008*****	**-.009*****	**.057*****	**.020*****	**.025*****	-.001
Education	-.001	**.039*****	.045	-.026	.029	**-.026***	**-.065***	-.016	**.027***	.007
Marital status (ref = married)										
Married, living sep	**-.191****	.135	.147	.019**	**.279*****	**-.226****	.154	.009	**.311*****	**-.954*****
Single	-.048	.084	.237	-.054*	.044	-.105	.209	.013	**.291*****	**-.308****
Divorced	-.023	.097	.026	-.085	**.152***	**-.197***	.041	-.019	.107	-.126
Widowed	-.103	.107	-.285	.223	**.219****	**.353****	**.657*****	**.275****	**.398*****	**-1.966*****
Spouse abroad	**.412***	.163	---	.349	.529	-.068	---	-.616	.076	---
SS, living together	-1.575	-.243	.111	**-.804***	**-1.094***	**-1.049****	-.420	**-1.633***	-.571	-.641
SS, living sep	**---**	---	---		---		---	---	---	---
Log income	**.286*****	**.106*****	.062	**.195*****	-.023	**1.206*****	**.693*****	**.233*****	.039	**.201*****
Employment status (ref = full-time job)										
Part-time job	**-.059***	.037	-.062	**-.131*****	**.073***	**-.300*****	**-.495*****	**.057***	**.589*****	**.097***
Apprenticeship	-.008	-.001	-.154	.074	-.011	**-.389*****	**-.545*****	.093	**.309*****	.172
Minor employment	**-.220*****	.021	-.008	**-.518*****	.008	**-.570*****	**-1.056*****	.053	**.882*****	.073
Unemployment	**-.263*****	-.009	.076	**-1.674*****	-.011	**-.624*****	**-1.750*****	**.054***	**1.146*****	**.180****

Note. LS = life satisfaction; HH = household; Inc = income; ref = reference; sep = separately; SS = same sex. Socio-Economic Panel, data from 1992 to 2013. *** $p < .001$. ** $p < .01$. * $p < .05$.

7 Statement of Originality

I hereby declare that I am the sole author of this dissertation and have made use of no sources other than those cited in this work.

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Julia Engel

8 Statement of Co-Author

It is hereby confirmed that the following articles were primarily conceived and written by Julia Engel. I sign this statement to the effect that Julia Engel is credited as the primary source of ideas and the main author of all articles.

Engel, J. & Bless, H. (2017). The more negative the more impact: Evidence from nationally representative data on the relation between domain satisfactions and general life satisfaction. *Social Psychology*, *48*, 148–159. doi: 10.1027/1864-9335/a000305. Current Impact Factor: 2.602.

Engel, J. & Bless, H. (2017). Lag and lead effects of critical life events - Now you see them, now you don't: Effects of childbirth on life satisfaction and domain satisfactions (submitted).

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Herbert Bless

References

Alves, H., Koch, A., & Unkelbach, C. (2016). My friends are all alike - the relation between liking and perceived similarity in person perception. *Journal of Experimental Social Psychology*, *62*, 103–117. doi: 10.1016/j.jesp.2015.10.011

Alves, H., Koch, A., & Unkelbach, C. (2017). Why good is more alike than bad: Processing implications. *Trends in Cognitive Sciences*, *21*, 72–82. doi: 10.1016/j.tics.2016.12.006

Andrews, F. M., & Withey, S. B. (Eds.). (1976). *Social indicators of well-being: America's perception of life quality*. New York, NY: Plenum Press.

Armenta, C., Bao, K. J., Lyubomirsky, S., & Sheldon, K. M. (2014). Is lasting change possible? Lessons from the hedonic adaptation prevention model. In K. M. Sheldon & R. E. Lucas (Eds.), *Stability of happiness. Theories and evidences on whether happiness can change* (pp. 57–71). London, UK, Waltham, MA, San Diego, CA: Elsevier Academic Press.

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, *5*, 323–370. doi: 10.1037//1089-2680.5.4.323

Baumeister, R. F., Vohs, K. D., Aaker, J. L., & Garbinsky, E. N. (2013). Some key differences between a happy life and a meaningful life. *The Journal of Positive Psychology*, *8*, 505–516. doi: 10.1080/17439760.2013.830764

Bernardi, L., Bollmann, G., Potarca, G., & Rossier, J. (2017). Multidimensionality of well-being and spillover effects across life domains: How do parenthood and personality affect changes in domain-specific satisfaction? *Research in Human Development*, *14*, 26–51. doi: 10.1080/15427609.2016.1268893

Blanchflower, D. G., & Oswald, A. J. (2008). Is well-being U-shaped over the life cycle? *Social Science & Medicine*, *66*, 1733–1749. doi: 10.1007/s11205-011-9903-9

Bless, H., & Burger, A. M. (2016). A closer look at social psychologists' silver bullet: Inevitable and evitable side effects of the experimental approach. *Perspectives on Psychological Science, 11*, 296–308. doi: 10.1177/1745691615621278

Bless, H., & Schwarz, N. (2010). Mental construal and the emergence of assimilation and contrast effects: The inclusion/exclusion model. *Advances in Experimental Social Psychology, 42*, 319–373. doi: 10.1016/S0065-2601(10)42006-7

Boswell, W. R., Boudreau, J. W., & Tichy, J. (2005). The relationship between employee job change and job satisfaction: The honeymoon-hangover effect. *Journal of Applied Psychology, 90,* 882–892. doi: 10.1037/0021-9010.90.5.882

Brickman, P., & Campbell, D. T. (1971). Hedonic relativism and planning the good society. In M. H. Apley (Ed.), *Hedonic relativism and planning the good society. Adaptation-level theory: A symposium.* New York, NY: Academic Press.

Brickman, P., Coates, D., & Janoff-Bulman, R. (1978). Lottery winners and accident victims: Is happiness relative? *Journal of Personality and Social Psychology, 36*, 917–927. doi: 10.1037/0022-3514.36.8.917

Campbell, A. (1976). Subjective measures of well-being. *American Psychologist, 31*, 117–124. doi: 10.1037/0003-066X.31.2.117

Campbell, A., Converse, P. E., & Rodgers, W. L. (1976). *The quality of American life: Perceptions, evaluations, and satisfactions*. New York, NY: Russell Sage Foundation.

Clark, A. E., Georgellis, Y., & Sanfey, P. (2001). Scarring: The psychological impact of past employment. *Economica, 68,* 221–241. doi: 10.1111/1468-0335.00243

Clark, A. E., Diener, E., Georgellis, Y., & Lucas, R. E. (2008). Lags and leads in life satisfaction: A test of the baseline hypothesis. *The Economic Journal, 118,* F222–F243. doi: 10.1111/j.1468-0297.2008.02150.x

Clark, A. E., & Georgellis, Y. (2013). Back to baseline in Britain: Adaptation in the British Household Panel Survey. *Economica, 80*, 496–512. doi: 10.1111/ecca.12007

Cohen, S., & Herbert, T. B. (1996). Health psychology: Psychological factors and physical disease from the perspective of human psychoneuroimmunology. *Annual Review of Psychology, 47*, 113–142. doi: 10.1146/annurev.psych.47.1.113

Coleman, L. M., Jussim, L., & Abraham, J. (1987). Students' reaction to teacher evaluations: The unique impact of negative feedback. *Journal of Applied Social Psychology, 17*, 1051–1070. doi: 10.1111/j.1559-1816.1987.tb02347.x

Costa, P. T., & McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology, 38*, 668–678. doi: 10.1037/0022-3514.38.4.668

Deaton, A., & Stone, A. A. (2016). Understanding context effects for a measure of life evaluation: How responses matter. *Oxford Economic Papers, 68*, 861–870. doi: 10.1093/oep/gpw022

DeNeve, K. M., & Copper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin, 124*, 197–229. doi: 10.1037/0033-2909.124.2.197

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*, 542–575. doi: 10.1037/0033-2909.95.3.542

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist, 55*, 34–43. doi: 10.1037/0003-066X.55.1.34

Diener, E. (2012). New findings and future directions for subjective well-being research. *American Psychologist, 67*, 590–597. doi: 10.1037/a0029541

Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? *Social Indicators Research, 57*, 119–169. doi: 10.1023/A:1014411319119

Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology, 68,* 653–663. doi: 10.1007/978-90-481-2352-0_4

Diener, E., & Diener, C. (1996). Most People Are Happy. *Psychological Science, 7,* 181–185. doi: 10.1111/j.1467-9280.1996.tb00354.x

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49,* 71–75. doi: 10.1207/s15327752jpa4901_13

Diener, E., Lucas, R. E., Oishi, S., & Suh, E. M. (2002). Looking up and looking down: Weighting good and bad information in life satisfaction judgments. *Personality and Social Psychology Bulletin, 28,* 437–445. doi: 10.1177/0146167202287002

Diener, E., Lucas, R. E., & Scollon, C. N. (2006). Beyond the hedonic treadmill: Revising the adaptation theory of well-being. *American Psychologist, 61,* 305–314. doi: 10.1037/0003-066X.61.4.305

Diener, E., Oishi, S., & Lucas, R. E. (2003). Personality, culture, and subjective well-being: Emotional and cognitive evaluations of life. *Annual Review of Psychology, 54,* 403–425. doi: 10.1146/annurev.psych.54.101601.145056

Diener, E., & Seligman, M. E. (2004). Beyond money: Toward an economy of well-being. *Psychological Science in the Public Interest, 5,* 1–31. doi: 10.1111/j.0963-7214.2004.00501001.x

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125,* 276–302. doi: 10.1037/0033-2909.125.2.276

Diener, E., Tay, L., & Oishi, S. (2013). Rising income and the subjective well-being of nations. *Journal of Personality and Social Psychology, 104,* 267–276. doi: 10.1037/a0030487

Dunn, E. W., Aknin, L. B., & Norton, M. I. (2008). Spending money on others promotes happiness. *Science, 319*, 1687–1688. doi: 10.1126/science.1152864

Dyrdal, G. M., & Lucas, R. E. (2013). Reaction and adaptation to the birth of a child: A couple-level analysis. *Developmental Psychology, 49*, 749–761. doi: 10.1037/a0028335

Eid, M., & Larsen, R. (Eds.). (2007). *The science of subjective well-being*. New York, NY: Guilford.

Eid, M., & Diener, E. (2004). Global judgments of subjective well-being: Situational variability and long-term stability. *Social Indicators Research, 65*, 245–277. doi: 10.1023/B:SOCI.0000003801.89195.bc

European Commission. (2009). *The provision of childcare services: A comparative review of 30 European countries*. Luxembourg: Office for Official Publications of the European Communities.

Fiske, S. T. (1980). Attention and weight in person perception: The impact of negative and extreme behavior. *Journal of Personality and Social Psychology, 38*, 889–906. doi: 10.1037/0022-3514.38.6.889

Frijters, P., Johnston, D. W., & Shields, M. A. (2011). Life satisfaction dynamics with quarterly life event data. *Scandinavian Journal of Economics, 113*, 190–211. doi: 10.1111/j.1467-9442.2010.01638.x

Georgellis, Y., Lange, T., & Tabvuma, V. (2012). The impact of life events on job satisfaction. *Journal of Vocational Behavior, 80*, 464–473. doi: 10.1016/j.jvb.2011.12.005

Gottman, J. (1994). *Why marriages succeed or fail*. New York, NY: Simon & Schuster.

Hayes, N., & Joseph, S. (2003). Big 5 correlates of three measures of subjective well-being. *Personality and Individual Differences, 34*, 723–727. doi: 10.1016/S0191-8869(02)00057-0

Headey, B., & Wearing, A. (1989). Personality, life events, and subjective well-being: Towards a dynamic equilibrium model. *Journal of Personality and Social Psychology*, *57*, 731–739. doi: 10.1037/0022-3514.57.4.731

Headey, B., Veenhoven, R., & Wearing, A. (1991). Top-down versus bottom-up theories of subjective well-being. *Social Indicators Research*, *24*, 81–100. doi: 10.1007/BF00292652

Heller, D., Watson, D., & Ilies, R. (2004). The role of person versus situation in life satisfaction: A critical examination. *Psychological Bulletin*, *130*, 574–600. doi: 10.1037/0033-2909.130.4.574

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *The Behavioral and brain sciences*, *33*, 61-83. doi: 10.1017/S0140525X0999152X

Ito, T. A., Larsen, J. T., Smith, N. K., & Cacioppo, J. T. (1998). Negative information weighs more heavily on the brain: The negative bias in evaluative categorizations. *Journal of Personality and Social Psychology*, *75*, 887–900. doi: 10.1037/0022-3514.75.4.887

Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Sciences of the United States of America*, *107*, 16489–16493. doi: 10.1073/pnas.1011492107

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*, 263–292. doi: 10.2307/1914185

Knabe, A., Rätzel, S., Schöb, R., & Weimann, J. (2010). Dissatisfied with life, but having a good day: Time-use and well-being of the unemployed. *The Economic Journal*, *120*, 867–889. doi: 10.1111/j.1468-0297.2009.02347.x

Laflamme, D., Pomerleau, A., & Malcuit, G. (2002). A comparison of fathers' and mothers' involvement in childcare and stimulation behaviors during free-play with their infants at 9 and 15 months. *Sex Roles*, *47*, 507–518. doi: 10.1023/A:1022069720776

Lawrence, E., Cobb, R. J., Rothman, A. D., Rothman, M. T., & Bradbury, T. N. (2008). Marital satisfaction across the transition to parenthood. *Journal of Family Psychology*, *22*, 41–50. doi: 10.1037/0893-3200.22.1.41

Lucas, R. E. (2007a). Adaptation and the set-point model of subjective well-being: Does happiness change after major life events? *Current Directions in Psychological Science*, *16*, 75–79. doi: 10.1111/j.1467-8721.2007.00479.x

Lucas, R. E. (2007b). Long-term disability is associated with lasting changes in subjective well-being: Evidence from two nationally representative longitudinal studies. *Journal of Personality and Social Psychology*, *92*, 717–730. doi: 10.1037/0022-3514.92.4.717

Lucas, R. E. (2005). Time does not heal all wounds: A longitudinal study of reaction and adaptation to divorce. *Psychological Science*, *16*, 945–950. doi: 10.1111/j.1467-9280.2005.01642.x

Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Reexamining adaptation and the set point model of happiness: Reactions to changes in marital status. *Journal of Personality and Social Psychology*, *84*, 527–539. doi: 10.1037/0022-3514.84.3.527

Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2004). Unemployment alters the set point for life satisfaction. *Psychological Science*, *15*, 8–13. doi: 10.1111/j.0963-7214.2004.01501002.x

Lucas, R. E., Diener, E., & Suh, E. (1996). Discriminant validity of well-being measures. *Journal of Personality and Social Psychology*, *71*, 616–628. doi: 10.1037//0022-3514.71.3.616

Lucas, R. E., Oishi, S., & Diener, E. (2016). What we know about context effects in self-report surveys of well-being: Comment on Deaton and Stone. *Oxford Economic Papers*, *68*, 871–876. doi: 10.1093/oep/gpw023

Luhmann, M., Lucas, R. E., Eid, M., & Diener, E. (2012). The prospective effect of life satisfaction on life events. *Social Psychological and Personality Science, 4*, 39–45. doi: 10.1177/1948550612440105

Luhmann, M., Hofmann, W., Eid, M., & Lucas, R. E. (2012). Subjective well-being and adaptation to life events: A meta-analysis. *Journal of Personality and Social Psychology, 102*, 592–615. doi: 10.1037/a0025948

Lykken, D., & Tellegen, A. (1996). Happiness is a stochastic phenomenon. *Psychological Science, 7*, 186–189. doi: 10.1111/j.1467-9280.1996.tb00355.x

Lyubomirsky, S. (2001). Why are some people happier than others? The role of cognitive and motivational processes in well-being. *American Psychologist, 56*, 239–249. doi: 10.1037//0003-066X.56.3.239

Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin, 131*, 803–855. doi: 10.1037/0033-2909.131.6.803

Margraf, J., Meyer, A. H., & Lavallee, K. L. (2013). Well-being from the knife? Psychological effects of aesthetic surgery. *Clinical Psychological Science, 1*, 239–252. doi: 10.1177/2167702612471660

Matheson, J. (2011). *Measuring what matters: National Statistician's reflections on the National Debate on Measuring Well-being*. London.

Maxwell, S. E., Lau, M. Y., & Howard, G. S. (2015). Is psychology suffering from a replication crisis? What does "failure to replicate" really mean? *The American psychologist, 70*, 487–498. doi: 10.1037/a0039400

Milkie, M. A., Bianchi, S. M., Mattingly, M. J., & Robinson, J. P. (2002). Gendered division of childrearing: Ideals, realities, and the relationship to parental well-being. *Sex Roles, 47*, 21–38. doi: 10.1023/A:1020627602889

Myers, D. G. (1999). Close relationships and quality of life. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 374–391). New York, NY: Russell Sage Foundation.

Myrskyla, M., & Margolis, R. (2014). Happiness: Before and after the kids. *Demography, 51*, 1843–1866. doi: 10.1007/s13524-014-0321-x

OECD. (2013). *OECD guidelines on measuring subjective well-being*. Paris: OECD Publishing.

Office for National Statistics. (2015). National well-being measures. Retrieved from http://webarchive.nationalarchives.gov.uk/20160105160709/http://www.ons.gov.uk/ons/dcp171766_417903.pdf

Oishi, S., Diener, E., Suh, E., & Lucas, R. E. (1999). Value as a moderator in subjective well-being. *Journal of Personality and Social Psychology*, *67*, 157–184. doi: 10.1111/1467-6494.00051

Oishi, S., Schimmack, U., & Colcombe, S. J. (2003). The contextual and systematic nature of life satisfaction judgments. *Journal of Experimental Social Psychology*, *39*, 232–247. doi: 10.1016/S0022-1031(03)00016-7

Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, *349*, aac4716. doi: 10.1126/science.aac4716

Peeters, G., & Czapinski, J. (1990). Positive-negative asymmetry in evaluations effects: The distinction between affective and informative negativity. *European review of social psychology*, *1*, 33–60. doi: 10.1080/14792779108401856

Penedo, F., & Dahn, J. (2005). Exercise and well-being: A review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry*, *18*, 189–193. doi: 10.1097/00001504-200503000-00013

Pratto, F., & John, O. P. (1991). Automatic vigilance: The attention-grabbing power of negative social information. *Journal of Personality and Social Psychology, 61*, 380–391. doi: 10.1037/0022-3514.61.3.380

Rammstedt, B., & Spinath, F. M. (2013). Öffentliche Datensätze und ihr Mehrwert für die psychologische Forschung. *Psychologische Rundschau*, *64*, 101–102. doi: 10.1026/0033–3042/a000156

Robinson-Riegler, G. L., & Winton, W. M. (1996). The role of conscious recollection in recognition of affective material: Evidence for positive-negative asymmetry. *Journal of General Psychology*, *123*, 93–104. doi: 10.1080/00221309.1996.9921263

Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review*, *5*, 296–320. doi: 10.1207/S15327957PSPR0504_2

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141–166. doi: 10.1146/annurev.psych.52.1.141

Sandvik, E., Diener, E., & Seidlitz, L. (1993). Subjective well-being: The convergence and stability of self-report and non-self-report measures. *Journal of Personality*, *61*, 317–342. doi: 10.1111/j.1467-6494.1993.tb00283.x

Schimmack, U. (2007). The structure of subjective well-being. In M. Eid & R. Larsen (Eds.), *The science of subjective well-being* (pp. 97–123). New York, NY: Guilford.

Schimmack, U., & Oishi, S. (2005). The influence of chronically and temporarily accessible information on life satisfaction judgments. *Journal of Personality and Social Psychology*, *89*, 395–406. doi: 10.1037/0022-3514.89.3.395

Schimmack, U., Schupp, J., & Wagner, G. G. (2008). The influence of environment and personality on the affective and cognitive component of subjective well-being. *Social Indicators Research, 89*, 41–60. doi: 10.1007/s11205-007-9230-3

Schul, Y., & Schiff, M. (1993). Measuring satisfaction with organizations: Predictions from information accessibility. *Public Opinion Quarterly, 57*, 536–551. doi: 10.1086/269394

Schwarz, N., & Strack, F. (1999). Reports of subjective well-being: Judgmental processes and their methodological implications. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 61–84). New York, NY: Russell Sage Foundation.

Schwarz, N., Strack, F., & Mai, H.-P. (1991). Assimilation and contrast effects in part-whole question sequences: A conversational logic analysis. *Public Opinion Quarterly*, *55*, 3–23. doi: 10.1086/269239

Schwarz, N., & Strack, F. (1991). Evaluating one's life: A judgment model of subjective well-being. In F. Strack, M. Argyle, & N. Schwarz (Eds.), *Subjective well-being. An interdisciplinary perspective.* Oxford, UK: Oxford University Press.

Sheldon, K. M., Ryan, R., & Reis, H. T. (1996). What makes for a good day? Competence and autonomy in the day and in the person. *Personality and Social Psychology Bulletin*, *22*, 1270–1279. doi: 10.1177/01461672962212007

Sheldon, K. M., & Lucas, R. E. (Eds.). (2014). *Stability of happiness: Theories and evidences on whether happiness can change*. London, UK, Waltham, MA, San Diego, CA: Elsevier Academic Press.

Skowronski, J. J., & Carlston, D. E. (1987). Social judgment and social memory: The role of cue diagnosticity in negativity, positivity, and extremity bias. *Journal of Personality and Social Psychology*, *52*, 689–699. doi: 10.1037/0022-3514.52.4.689

Skowronski, J. J., & Carlston, D. E. (1989). Negativity and extremity biases in impression formation: A review of explanations. *Psychological Bulletin, 105*, 131–142. doi: 10.1037/0033-2909.105.1.131

Smith, D. M., Schwarz, N., Roberts, T. R., & Ubel, P. A. (2006). Why are you calling me? How study introductions change response patterns. *Quality of Life Research, 15*, 621–630. doi: 10.1007/s11136-005-4529-5

Statistisches Bundesamt. (2008). Datenreport 2008: Ein Sozialbericht für die Bundesrepublik Deutschland. Retrieved from https://www.destatis.de/DE/Publikationen/Datenreport/Downloads/Datenreport2008.pdf?__blob=publicationFile

Statistisches Bundesamt. (2009). Im Blickpunkt: Jugend und Familie in Europa. Retrieved from https://www.destatis.de/DE/Publikationen/Thematisch/Internationales/IBJugendFamilieEuropa.pdf?__blob=publicationFile

Statistisches Bundesamt. (2016). Datenreport 2016: Sozialbericht für die Bundesrepublik Deutschland. Retrieved from https://www.destatis.de/DE/Publikationen/Datenreport/Downloads/Datenreport2016.pdf?__blob=publicationFile

Stiglitz, J. E., Sen, A., & Fitoussi, J.-P. (2009). Report by the commission on the measurement of economic performance and social progress. Retrieved from http://www.stiglitz-sen-fitoussi.fr/documents/rapport_anglais.pdf

Strack, F., Martin, L. L., & Schwarz, N. (1988). Priming and communication: Social determinants of information use in judgments of life satisfaction. *European Journal of Social Psychology, 18*, 429–442. doi: 10.1002/ejsp.2420180505

Stroebe, W., & Strack, F. (2014). The Alleged Crisis and the Illusion of Exact Replication. *Perspectives on Psychological Science*, *9*, 59–71. doi: 10.1177/1745691613514450

Suh, E., Diener, E., & Fujita, F. (1996). Events and subjective well-being: Only recent events matter. *Journal of Personality and Social Psyochlogy*, *70*, 1091–1102. doi: 10.1037/0022-3514.70.5.1091

Taylor, S. E., & Brown, J. D. (1994). Positive illusions and well-being revisited: Separating fact from fiction. *Psychological Bulletin*, *116*, 21–27. doi: 10.1037/0033-2909.116.1.21

Taylor, S. E., & Brown, J. D. (1988). Illusion and Well-Being: A Social Psychological Perspective on Mental Health. *Psycholocial Bulletin*, *103*, 193–210. doi: 10.1037/0033-2909.103.2.193

Veenhoven, R. (1991). Is happiness relative? *Social Indicators Research*, *24*, 1–34. doi: 10.1007/BF00292648

Wagner, G. G., Frick, J. R., & Schupp, J. (2007). The German Socio-Economic Panel Study (SOEP): Scope, evolution and enhancements. *Schmollers Jahrbuch*, *127*, 139–169. doi: 10.2139/ssrn.1028709

Wengle, H. (1986). The psychology of cosmetic surgery: A critical overview of the literature 1960-1982. Part I. *Annals of plastic surgery*, *16*, 435–443. doi: 10.1097/00000637-198605000-00011

Wilson, T. D., Wheatley, T., Meyers, J. M., Gilbert, D. T., & Axsom, D. (2000). Focalism: A Source of Durability Bias in Affective Forecasting. *Journal of Personality and Social Psychology*, *78*, 821–836. doi: 10.1037/W022-3514.78.5.82I

Wilson, T. D., & Gilbert, D. T. (2005). Affective Forecasting. *Current Directions in Psychological Science*, *14*, 131–134. doi: 10.1111/j.0963-7214.2005.00355.x