Soc Indic Res (2013) 111:265–286
DOI 10.1007/s11205-012-0004-1

Zooming in on Life Events: Is Hedonic Adaptation Sensitive to the Temporal Distance from the Event?

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Accepted: 31 January 2012 / Published online: 10 February 2012

Abstract This paper analyzed the effect of major positive and negative life events (marriage, divorce, birth of child, widowhood, and unemployment) on life satisfaction. For the first time, this study estimated the effects of life events not with a precision of 12 months but of 3 months. Specifically, two questions were addressed: (1) Does the precision of the temporal localization of the event (i.e., 12 or 3 months) affect the observed trajectories of life satisfaction, and (2) is the precision of the temporal localization more important for negative life events? As expected, results showed that the precision of temporal localization allows a clearer view on hedonic adaptation, in particular following negative life events.

Keywords Subjective well-being · Adaptation · Life events

1 Introduction

Contemporary theorizing on the regulation of subjective well-being (SWB) attempts to build a comprehensive model linking three groups of factors: life circumstances (environment), person factors, and life events. The question whether the effect of major critical life events is temporary or permanent has been the subject of intensive debate over the recent decades. Although there is some empirical support for the chronic strain perspective (e.g., Lucas 2007), which showed that crucial experiences (at least, some of them) have long-lasting consequences for levels of SWB, the literature in the area is still dominated by the hedonic treadmill theory (Brickman and Campbell 1971), which claims that SWB eventually returns to its person-specific baseline. Eventual reversion to the pre-event level is conceptualized as hedonic adaptation to a given life experience.

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To date, the question of whether major life events in general have a permanent or temporary impact has gradually transformed into or has been complemented by another one: *which factors* shape the adaptation trajectory (e.g., Staudinger 2000). It has been documented that both pre- and post-event dynamics of SWB varies across: (a) individuals; for example, personality traits, such as extraversion and neuroticism, moderate the effect of life experience on SWB (Diener et al. 2006; Greve and Staudinger 2006; Headey 2008; Staudinger et al. 1995); (b) contexts: forewarning influences the speed of adaptation (Frederick and Loewenstein 1999); (c) time since the event: the adaptation to a partner's loss follows a curvilinear pattern: it goes faster right after the loss, and slows down over time (Burke et al. 2007).

Compared to inter-individual and inter-contextual differences in habituation, however, the question of timing has received less attention. The existing literature mostly relies on large-scale survey data sets, which usually provide annual measurements of SWB. This design implies that the target event may have happened at one of 12 months between two subsequent measurements of SWB. As a consequence participants may be at quite different points in their adaptation process when they are measured again according to the yearly assessment design. There is evidence, however, that only recent events demonstrate a significant effect on SWB (Suh et al. 1996), thus, averaging scores of SWB across a year may lead to an underestimation of the initial reaction and a distortion of the observed adaptation trajectory. The 12-months precision may be indeed efficient if the focus is on establishing the sheer fact that adaptation to a given experience takes place. Given such a focus the potential underestimation of the immediate reaction may seem uninteresting and may therefore be disregarded. The 12-months assessment strategy might fail, however, if the focus is on gaining deeper insight into the process of adjustment and on obtaining precise estimates of SWB changes following the event under investigation, especially because the strongest effects have been reported to occur in the immediate temporal vicinity of the event (Burke et al. 2007; Clark et al. 2008).

This is where the current study makes a contribution. It profits from the availability of monthly records concerning important life events in the German Socio-Economic Panel data. Thus, we were able to use more precise information on the timing of life events, that is, in which *quarter* of the year the event had taken place rather than using the year of the event as it is common in the literature (e.g., Clark et al. 2008; Lucas 2005, 2007; Zimmermann and Easterlin 2006).[1] Based on such 'higher temporal resolution' we hoped to test two major hypotheses: (a) patterns of SWB adaptation assessed using a quarterly resolution differ from those assessed using a yearly resolution; and (b) major life events differ with regard to their sensitivity to quarterly timing. Five major life events were considered: marriage (positive), birth of child (positive), unemployment (negative), divorce (negative), and widowhood (negative).

1.1 Hedonic Adaptation to Life Events

Hedonic adaptation may be defined as a reduction in the affective intensity of favorable and unfavorable circumstances across time (Frederick and Loewenstein 1999). This process comprises an anticipatory and a reactive part. In the present study, we have used SWB—defined as judging life positively and feeling good (Diener et al. 1997)—as a proxy measure of hedonic adaptation. We employed one-item indicator of SWB, that is, overall

[1] To our knowledge, only Frijters et al. (2011) apply quarterly timing of life events to large-scale panel data (HILDA); they do not focus, though, on the comparison of yearly and quarterly measurements.

life satisfaction. Life satisfaction is often viewed as the cognitive evaluation of one's life reflecting the goodness of fit between personal aspirations and perceived reality (Grob et al. 1996; Diener and Lucas 1999); the relative contribution of cognition and emotions to judgments of life satisfaction has, however, been a topic of discussion (e.g., Davern et al. 2007).

The question whether the effect of crucial life events on subjective well-being is temporary or permanent has been addressed by the hedonic treadmill model, which claims that even the most dramatic experiences, such as becoming disabled as a result of an accident or winning a large sum in a lottery, have much less of a long-lasting impact on subjective well-being than might be expected (Brickman et al. 1978). A solid body of empirical evidence suggests that adaptation (i.e., SWB equilibrium being challenged by a certain experience, but restoring, eventurally) is a rather wide-spread pattern of SWB dynamics as triggered by critical life events, but not without exceptions. There is an ongoing discussion whether or not marriage, divorce, widowhood, and unemployment lead to everlasting changes in SWB. There are arguments in favor of complete adaptation to *marriage* within 2 years after the event (Clark et al. 2008; Lucas et al. 2003).[2] There is no complete adaptation to *unemployment* (Clark et al. 2008; Lucas et al. 2004) even after 4 years,[3] or to *disabilities* (Lucas 2007). *Divorce* is a controversial event for it has potential for both, positive and negative, outcomes. On the one hand, divorce leads to lower happiness (Amato 2000; Erbes and Hedderson 1984; Forste and Heaton 2004; Gähler 2006), health problems and higher mortality (Vallin and Nizard 1977), poor self-concept and self-acceptance (Amato 2000), lower standard of living, especially for women (Andress and Brackel 2007), and lower SWB (Lucas 2005). At the same time, divorce leads to more autonomy, career[4] and personal growth (Amato 2000); contrary to earlier findings (Lucas 2005), recent studies seem to report full and rather rapid adaptation to divorce (Clark et al. 2008).

Differences in findings are partly due to differences in analytical techniques.[5] However, findings also suggest that reaction patterns depend on the *type of event*, therefore, deeper understanding of how characteristics of events influence the adaptation profile is needed.

Experiences, which are subject to hedonic adaptation, are also not homogenous in terms of anticipation length and the duration of the adjustment process. This may have consequences for how sensitive a given event is in terms of the precision with which the timing of the event is taken into consideration. In that sense, time is an important predictor of adjustment to *widowhood*, but not of adjustment to *divorce*, if 6-months' intervals are used[6] (Farnsworth et al. 1989). Depending on the event (marriage, divorce, birth of child, widowhood, layoff, or unemployment) and gender (Clark et al. 2008), the anticipation period

[2] On the other hand, Zimmermann and Easterlin (2006) apply different models to the same dataset (GSOEP) and report that individuals who remain married for 2 or more years do not go back to their pre-marriage baseline but rather remain at a higher level.

[3] Moreover, continuous exposure to unemployment may evoke sensitization - an increase of the initial reaction rather than adaptation (Frederick and Loewenstein 1999; Luhmann and Eid 2009).

[4] For women.

[5] Given that the data in the cited sources were collected at different decades of the twentieth century, one may also hypothesize that, incidentally, cohort effects may play a role.

[6] I.e. within 2 years following the loss of spouse, SBW increases significantly from one 6-month period to another. This pattern does not apply to divorce. This study takes into account only 2 years after divorce/widowhood; it is plausible that time becomes a predictor if longer time span is considered.

might comprise zero to 4 years[7]; for some events, there is a rapid return to baseline satisfaction, while others (*marriage* and *unemployment*) have longer lasting effects. These findings suggest that yearly measurements may allow quite accurate approximation of the adaptation process for some events but not for others.

Research on the regulation of SWB has so far been primarily concerned with confirming (or refuting) the sheer fact of adaptation to a given experience. Less attention has been paid to the temporal distance between the event and the SWB measurement, which may, however, play a crucial role with regard to the precision of the trajectory of adaptation.

1.2 Event Characteristics that Influence the Speed of Adaptation

Little is known about which event characteristics might alter the speed and degree of habituation. In the following, we describe features of critical life events, which have received attention in the literature: valence, uncertainty, and normativity.

Valence. People tend to adapt more quickly to positive than negative events, provided that the events are more or less of the same seriousness (Lyubomirsky 2011; Suh et al. 1996; Wilson and Gilbert 2008). Moreover, people seem to never fully adapt to certain negative experiences, whereas hardly any research suggests that SWB boosts after positive experiences are (ever) long-lasting. This "bad is stronger than good" phenomenon has also been reported for a number of other cognitive and emotional phenomena, such as first impression, monitoring and remembering negative feedback, etc. (see Lyubomirsky 2011 for review).

A number of theoretical accounts can be called upon in order to argue for the importance of the valence of an event for the subsequent regulatory process. Prospect theory, for instance, argues that losses have a bigger impact on behavior, well-being and decision-making than gains (Kahneman and Tversky 1984). The AREA model of hedonic adaptation (Wilson and Gilbert 2008) suggests that habituation to experiences involves three processes—attending, reacting and explaining. Habituation to positive events goes faster, because people are less likely to attend to them, exhibit weaker emotional reactions, and find explanations much easier. Explanations provided for the stronger effects of negative experiences include evolutionary and cultural perspectives. Stronger reactions to negative experiences are functional (adaptive, important for survival), since positive events only inform individuals that everything is going well, whereas negative experiences signal potential threat (Lyubomirsky 2011). According to the frequency model, positive events have weaker effects on well-being only in cultures high in global well-being, due to the reduced effect of a single positive event among many other positive events (Oishi et al. 2007). This should be very different, however, in a culture with a low level of global well-being.

Although it is well documented that adaptation to negative events goes at a slower pace, there are reasons to believe that SWB dynamics follow a curvilinear trajectory, adjustment happening more rapidly at the initial stage of experience and subsequently slowing down (Carnelley et al. 2006). The curvilinear pattern is due to a differential activation of regulatory processes depending on the gap between the respective current state and the equilibrium state. Therefore, regulatory processes should be stronger at first, and slower

[7] More precisely, for women, anticipation of unemployment, birth of child and layoff lasts for about 1 year, whereas men anticipate divorce for 3 years, marriage and widowhood—for 2 years. In females, there are no lead effects in cases of marriage and birth of child, unemployment is anticipated for about 1 year, widowhood—for 3 years and divorce—for 4 years.

later on. Given that the initial reaction to negative experiences is stronger than to positive ones, it is plausible that the slope of the adaptation trajectory also is steeper in case of negative events.

Uncertainty. One of the important processes supporting affective habituation is the possibility to explain the event (Wilson and Gilbert 2008). Finding meaning in the experience fosters recovery from marital dissolution, death of spouse (Bonanno et al. 2002). Being *uncertain* of the final outcome (i.e., whether the event will happen or not, or, what kind of consequences it will entail), makes it more difficult to find an appropriate explanation, therefore, inhibits habituation to both negative and positive experiences (Wilson and Gilbert 2008).

Normativity of the event as a factor, which influences the adaptation process, has two dimensions: normativity of the event within a life-course of a concrete individual and frequency of this event in a given population. Both can influence the strength of initial reaction to the experience. Deviation from a person's typical events (both positive and negative) has greater impact on subjective well-being. In other words, if a person experiences a spell of positive events, he/she is less affected by one additional positive event than someone who does not experiences many positive events (Headey and Wearing 1989; Oishi et al. 2007). Perhaps, normativity is related to easiness of finding an explanation as it might be more difficult to explain events that are unusual in any respect.[8] Normativity of the event for the community (milieu, region) also appears to be a predictor of reaction strength. Research on unemployment has shown that higher regional rates of unemployment seem to be a protective factor, which makes the unemployed feel better (Clark et al. 2009). Although predictors of the initial reaction do not necessarily serve as predictors of either adaptation speed or the adaptation trajectory, it is plausible that more effort is required to explain an event that does not comply with the social norm as well as to protect one's self esteem.

1.3 The Current Study

The majority of findings, described in the previous sections, relies on the analysis of aggregated data (i.e., yearly measures of SWB) and provides only an approximation of the level of life satisfaction around the time of an event, because usually it is not taken into account (other than within the last 12 months) how much time has passed between the event and the SWB assessment. Therefore, we cannot precisely determine how strong the reaction at the time of the event may have been; some individuals may have experienced the event 11 or 12 months ago and may have already returned to earlier levels of SWB whereas others have experienced the event just 2 or 3 months ago and are still in the midst of the first very dynamic phase of the adaptation process. Averaging across such individuals as it is usually done in the analysis of survey panel data thus puts apples and oranges in one basket. As a consequence our insight in the effects of certain life events may be hampered.

Of course, the yearly-measurement approach assumes that the overall insight into the process of adaptation is not severely compromised by the fact that events may have

[8] The picture is, however, more complicated. Research on repeated life events reveals, in fact, different patterns of well-being dynamics; in case of repeated unemployment we observe sensitization rather than adaptation, whereas repeated marriages remain as good as the first one, whereas second divorces evokes weaker response than the first one (Luhmann and Eid 2009). Apparently, individual normality intertwines with other factors.

happened either 1 or 11 months ago. It is known, however, that the time passed since the event is one of the main predictors of the level of adaptation measured at a given point in time. The strength of this effect may vary however, depending on the features of a particular event. In the current study we focused on v*alence*, taking into account two considerations. Firstly, as discussed above, a solid body of literature suggests that valence is an important predictor of adaptation length and of the strength of the initial reaction, that is, negative events lead to greater turbulence in well-being around the time of the event, and adaptation to negative events takes longer. Secondly, we assumed that from an outsider's perspective, valence is the easiest characteristic to determine, compared to, for example, degree of predictability, or normality. Therefore, validity of evaluating an event as negative or positive is higher compared to assessing it as predictable/unpredictable. Thus, the present study has tested whether in the case of negative events a temporally more fine-grained measurement indeed results in demonstrating a different adaptation trajectory.

The present study investigated two hypotheses:

Hypothesis I The precision of temporal localization of an event (i.e., yearly or quarterly timing) affects the observed trajectories of adaptation.

Hypothesis II The valence of an event affects the importance of the temporal resolution of the SWB assessment in relation to the event; precise timing (i.e., quarterly measurements) is more important for negative events (divorce, widowhood, unemployment).

2 Method

2.1 Sample and Design

To investigate the hypotheses formulated above, the present study used data from the twenty-four waves of the West German sub-sample of the GSOEP, 1984–2007 (Haisken-DeNew and Frick 2005). 24 Waves of the GSOEP allow following an individual for up to 23 years after an event. The GSOEP is a longitudinal survey of persons and households. It started in the FRG in 1984. In 1990 the survey was expanded to the former GDR. GSOEP samples were composed by means of the multi-stage random selection method. All samples have been regionally clustered. The GSOEP questionnaires cover a range of essential domains, such as education and qualification, labor market and occupational events, income, social security, household composition, health, housing conditions, family dynamics, values and attitudes, and the subjective evaluation of life domains and life in general. The interview design aims to obtain personal interviews with all members of a household who have reached the age of 16. One member of the family provides information about the household and the children in the household. Family members, who have left their household, are followed up at their new place of residence. New members of a household join the survey.

The key advantage of this data set for our questions is that we were able to identify the events in question on a monthly basis rather than on the yearly basis used by previous studies. GSOEP has been asking individuals to detail the month in which a life event occurred, which allows us to estimate anticipation and adaptation effects with regard to the month in which it occurred. In the present study, we used information about the actual *quarter* of the year when the event had taken place rather than the year of the event as it is common in the literature. Table 1 shows the number of observations per event. Table 2 presents the characteristics of the GSOEP (Western German subsample), 1984–2007.

Table 1 Number of observations per event

Adaptation phase	Marriage	Birth of child	Divorce	Widowhood	Unemployment
Anticipation					
10–12 Months before	202	254	118	119	205
7–9 Months before	290	249	104	160	148
4–6 Months before	450	265	100	140	138
0–3 Months before	475	283	97	156	46
Reaction					
0–3 Months after	291	315	146	154	153
4–6 Months after	422	288	121	166	93
7–9 Months after	574	253	105	149	65
10–12 Months after	406	238	117	128	51

Table 2 Characteristics of the selected subsample of the GSOEP (1984–2007)

Number of individuals	9,679
Number of person-year observations	120,747
Mean satisfaction with life	7.08 (SD = 1.84)
Mean length of education	11.4 (SD = 2.42)
Average household income per capita	11,511 (SD = 7,656)
Unemployed	5.10%, or 6,163 persons-year observations
Male	47.5%
Mean age	48.7 (min. 17, max. 99)
Number of children in the household	0.53 (0.89)
Employed	49.03%, or 59,207 persons-year observations

2.2 Measures

Life satisfaction. As a proxy measure of the reaction to an event, we used one principal dependent variable—life satisfaction. It was measured with the following item: "How satisfied are you with your life, all things considered?" Responses are distributed on an 11-point scale (0–10), where 0 corresponds to "Completely dissatisfied" and 10 mean "Completely satisfied". Appendix 1 shows the distribution of this item for the West German GSOEP sub-sample used in our subsequent empirical analysis.

Life events. The following events were assessed using an activity calendar: positive- marriage, child birth; negative- divorce, widowhood, unemployment. The activity calendar used in GSOEP encompasses a set of questions referring to certain life events which might have taken place during the year since the last assessment (and during the previous year[9]). Moreover, respondents were asked to indicate the exact month of the event. As it might be the case that people react differently to the first event as compared to repeated events (e.g., first marriage, child, unemployment, etc.), only first events were taken into account. Effects of future unemployment are only estimated for those who are currently employed.

Time since event. Two phenomena, anticipation and adaptation, were modeled separately. In order to build homogenous subsamples, we broke the first year after an event into

[9] To analyze the anticipatory stage of adaptation process.

four periods of 3 months each. We estimated the effect of the event on life satisfaction separately for four groups: individuals who experienced the event within 0–3 months (within 4–6, 7–9, and 10–12 months) prior to the interview. The same strategy was used to estimate the effect of an upcoming event on life satisfaction. For this, we also created four groups: individuals who will have experienced an event within 3 months after the interview, within 4–6, 7–9, and 10–12 months, respectively.

Control variables. The list of control variables included marital and labor force status, years of education, number of children, partner's employment status, income (annual household income per capita), age, gender, health status, and year of survey. *Number of children* is a continuous variable, which indicates total number of children under the age of 18 in the household. *Marital status* is a five-categories variable: married, living together with my spouse, married, living (permanently) separated from my spouse, single, divorce, widowed. *Number of years of education* was constructed such that it indicates the number of completed years in education at the time of survey. Income was measured by the annual household post-government income (a generated variable) divided by the number of household members. *Household post-government income* represents the total family income (including revenues from labor earnings, asset flows, retirement and social security pensions, private and public transfers), after taxes. In order to identify the *partner's employment status*, a generated variable 'partner person number' was used; it allowed linking an individual to his/her respective partner and derive the respective information about the partner. As regards *health status*, the argument has been made that health (just like income) is not entirely an exogenous variable, therefore it should be excluded from the list of control variables (Blanchflower and Oswald 2004). At the same time, health is an important correlate of SWB. Taking both arguments into account, we rejected self-reported health, often used as a control in SWB studies, and chose an objective indicator instead—the annual number of visits to a doctor. Finally, *labor status* was identified as either employed (full-time or part-time), or unemployed (identified as being not employed and officially registered as unemployed).

The operationalization of the 'unemployment status' requires additional clarification. After the first wave 'unemployment' has been indicated by the option 'not employed,' which may have multiple meanings. Therefore, we used an item which indicated how exactly the job was terminated (the question had eight answer options: because my place of work or office has closed, resignation, dismissal, mutual agreement, a temporary job or apprenticeship had been completed, reached retirement age, suspension, purpose of my self-employment/business). Our definition of unemployment only comprises persons who reported that they "were dismissed" or "their contract was terminated by employer".

2.3 Analytic Strategy

Our goal was to compare two models: in the first model the reaction period comprised 1 year after an event, in the second one the reaction period was limited to 3 months. Status passages were indexed by dummy variables; four dummies identify the quarter when an event had occurred; they indicate whether an individual experienced an event within 0–3 (4–6, 7–9, 10–12) months *preceding* the interview at t_0.[10] The same approach was applied to anticipation. Four dummies were created in order to identify whether an event occurred within 0–3 (4–6, 7–9, 10–12) months *after* the interview at t_{-1}.[11]

[10] The first interview after the event took place.

[11] Since the time span between two interviews is sometimes less than 12 months, it happens than an individual appears in two groups, i.e. once in the group of respondents who will experience an event in

Furthermore, we ran pair-wise comparisons of regression slopes—of that obtained for individuals who experienced the event at any point within 12 months prior/after the interview and the one estimated for respondents who had undergone the transition within one of four quarters. If there were no significant difference in reaction to an event between groups ($\beta^1 = \beta^j$; $j = 1, 2, 3, 4$), we argued that the 'aggregated' approach provides accurate estimation of an event's effect. If, however, there was a significant difference between groups, we claimed that the 'aggregated' strategy overlooks the dynamics of subjective well-being and leads to underestimation of an event's effect; therefore, more precision in the temporal localization of the event is necessary to derive the adequate anticipation/adaptation trajectory.

Analysis of the panel data allows to overcome certain shortcomings of cross-sectional studies. One of such shortcomings is unobserved heterogeneity. Unobserved characteristics may bias the results, by being correlated with both the independent and the dependent variables. For example, some personality traits may influence both the probability of getting married and life satisfaction. Also, self-selection operates along events' effects, which means that people with initially higher or lower levels of SWB (which could, in turn, result from being characterized by a certain personality type) are likely to have a particular experience, such as get married or divorced (Forste and Heaton 2004; Graham et al. 2004; Headey and Wearing 1989; Lucas 2005; Stutzer and Frey 2006). In panel data analysis, there are several ways to deal with unobserved heterogeneity. In this study two approaches were considered: the fixed effects model and the Mundlak model.

Modelling with fixed effects allows controlling for unobserved heterogeneity, that is, time-invariant characteristics, even if we do not measure them. The main advantage of the fixed effects model is that it relies on *within-person variation* and controls for time-invariant characteristics (e.g., personality, gender, etc.). This means, however, that such a model is only capable of estimating the effect of time-*variant* variables.

An approach to capture the unobserved heterogeneity and estimate the effect of time-*invariant* variables and, at the same time to control for possible correlations between unobserved heterogeneity and independent variables was offered by Mundlak (1978). The Mundlak model is based on the assumption that unobserved heterogeneity consists of two parts. The first part is uncorrelated with the observed variables, whereas the second part, supposedly, varies linearly and constantly over time with individual means; for instance, the correlation between personality and life satisfaction, as well as the probability of getting married remains linear and constant over time. Implementation of the Mundlak specification, therefore, augments the random-effects model with the individual means for time-variant independent variables. Implementation of individual means is assumed to partial out possible correlation between independent variables and unobserved heterogeneity (e.g., personality traits and probability of getting married) out of the effect of independent variables (e.g., getting married) on life satisfaction.

Equations 1, 2 and 3 illustrate the fixed effects model and the Mundlak model, respectively.

$$y_{it} - \bar{y}_i = \beta(x_{iy} - \bar{x}_i) + \varepsilon_{it} - \bar{\varepsilon}_i, \tag{1}$$

$$y_{it} = \alpha_i + x'_{it}\beta + \varepsilon_{it} \tag{2}$$

Footnote 11 continued
10–12 months, and again in the group of those who will experience it within 3 months after the interview. The numbers of such cases is small: 17 for marriage, 5 for divorce, 13 for unemployment, 15 for birth of child, and 10 for widowhood.

$$\alpha_i = \alpha\bar{x}_i + \omega_i, \tag{3}$$

where y_{it} is the independent variable for individual i ($i = 1, \ldots, n$) at time period t ($t = 1, \ldots t$), α_i is an individual specific and time-invariant random component, x'_{it} is a vector of explanatory variables, ε_{it} is a normally distributed error term. In the Mundlak model, α_i is a function of $\bar{x}_i$, the within-individual means over t of the x'_{it} variables, and ω_i, the normally distributed random effect.

As the Mundlak model is more efficient because it allows taking into account both time-variant *and* time-invariant characteristics, we used it as the principal strategy for our analysis. The Hausman test was performed in order to compare the Mundlak model and the fixed effects model. In our case Hausman tests were insignificant (for example, the test for marriage had a $\chi^2 = 18.36$, $p = 0.39$), which proved that there are no systematic differences between the two models. Therefore only the results of the Mundlak model (as the more efficient one) are discussed. The results of the fixed effects model are reported as a test of the robustness (a similar strategy was employed by Andersen 2008).

The next question that arose was whether regression slopes were the same across the two analytic approaches—the one which included individuals who experienced an event within 1 year ('aggregated' sample) and the one which limited event timing to a quarter of a year. The null hypothesis tested the claim that the slopes were the same:

$$\mathrm{H}^0 : \beta^1 = \beta^{\mathrm{j}}$$

where β^1 denotes the slope of regression line obtained with yearly measurements, whereas β^{j} denotes the slope of jth subgroup (j = 1, 2, 3, 4). In order to formally compare estimates obtained with yearly and quarterly measurements, the whole sample was randomly divided into two parts in the proportion of 1/3 and 2/3. This strategy allowed running two analyses on two independent samples, and, consequently, comparing the coefficients. The subsample, which was further divided into four subgroups according to the temporal distance from the event, was made twice as big as the other one in order to avoid too small cell sizes.[12]

The comparison of subgroups was done using the formula suggested by Cohen (1983):

$$\mathrm{Z}_{\alpha/2} \leq \frac{b_1 - b_2}{\sqrt{SE_1^2 + SE_2^2}} \leq \mathrm{Z}_{1-\alpha/2}, \tag{4}$$

where SE_1 and SE_2 denote standard errors of b_1 and b_2, respectively, and $Z_{1-\alpha/2} = 1.96$ for $\alpha = .05$. The formula 4 defines the acceptable region for *Z*-scores.

The same formula was used to additionally test whether regression slopes were the same across four subgroups ($\mathrm{H}^0 = \beta^1 = \beta^2 = \beta^3 = \beta^4$, β denotes the slope of jth subgroup, j = 1, 2, 3, 4). This comparison revealed, which subgroups differ in the level of life satisfaction, thus, it allowed identifying significant changes in SWB dynamics throughout 2 years surrounding the event.

3 Results

Results by and large confirmed our expectations. Not always is it necessary to take a more precise look at the temporal localization of the critical life event in order to get a more

[12] If, for example, the sample were split into two equal halves, the problem of too small cell sized would have been encountered. In fact, even with 2/3 of the whole sample we encounter this problem in two subgroups in the case of unemployment.

realistic view on the adaptation process but sometimes indeed it is. As expected, it is the negative events that disclose their dynamic only under more refined scrutiny.

Tables 3 and 4 show the regression coefficients obtained with the Mundlak model.[13] Figure 1 depicts the effect of five life events on life satisfaction across a period of 2 years. Estimates from the fixed effects model are presented in the Appendix 2. Visual comparison of the coefficients indicates that the differences between the two models are small. As mentioned before, the formal Hausman test confirmed similarity between the two models.[14]

The main research questions of the paper were first whether the yearly temporal resolution may distort SWB trajectories around central life events and second whether the higher temporal resolution (i.e., quarterly) is more important for negative events. Table 5 shows the Z-scores obtained from comparing yearly and quarterly measurements. Results showed that indeed it is only important for negative events to use the quarterly resolution.

For positive events no information is lost when aggregating on a yearly basis. As expected, the trajectories of life satisfaction around marriage and birth of child are not sensitive to the change in temporal resolution, at least, not for the intervals chosen for this study, and, at least, not within 1 year following/preceding the event. All Z-scores, reflecting the pairwise comparison of quarterly and yearly reactions, were not significant. In the case of having a child there is a slight reversion of SWB to the baseline: almost none of the Z-scores were significant except for the one relating to the difference between the initial reaction (by initial reaction we mean the level of SWB within the first 3 months after the event) and 7–9 months ($Z = 2.11$**[15]).

A different picture is revealed for the negative events—divorce, widowhood, and unemployment. Using the temporal resolution of a year clearly underestimates the initial impact of these events on life satisfaction. In the case of widowhood, we observe a strong negative initial reaction, which is preceded and followed by rapid changes in life satisfaction. The dynamics of SWB before and after losing a partner is the most volatile among all the events under investigation. Comparison of yearly and quarterly models shows that only the 2nd quarter (i.e., 3–6 months after the loss) does not differ from the estimates obtained with the yearly resolution. The initial reaction is much stronger when estimated with the quarterly approach ($Z = 2.9$***), whereas during the 3rd and the 4th quarters following the loss respondents already report higher level of life satisfaction than compared to what can be assumed with the yearly measurements ($Z = 2.4$*** and $Z = 1.93$**, respectively). Pairwise comparison of differences between quarterly estimates provides additional information. The initial reaction differs substantially from the level of life satisfaction right before the event ($Z = 5.4$**), as well as from the second, third and fourth quarters after partner's death ($Z = 3.2$**, 5.5**, 4.9**, respectively). The second quarter after the event is different from two next ones ($Z = 2.5$** and $Z = 1.95$*, respectively). Apparently, 6 months is an important threshold in the SWB dynamics triggered by widowhood, since the two last quarters are not different from each other.

In the case of divorce the initial reaction is also underrated when the yearly resolution is applied ($Z = 2.85$***). Pairwise comparison of the subgroups reveals a clear threshold

[13] Tables 3 and 4 present estimates obtained *on the whole sample*. The coefficients obtained with split sample provide virtually the same results.

[14] With respect to the relationship between control variables and SWB, our findings, in general, support the exitant literature. Having health problems, being widowed (as compared to being single), being unemployed, having an unemployed partner, and higher number of children affect SWB negatively. Being married (as compared to being single), and higher household income are positively related to SWB.

[15] *** Significant at 0.01; ** Significant at 0.05; * Significant at 0.1.

Table 3 Reactive adaptation to life events (comparing quarterly and yearly precision in temporal localization)

Precision of temporal localization	Marriage	Birth of child	Divorce	Widowhood	Unemployment
3-Months					
1–3 Months after the event	.424*** (.10)	.392*** (.08)	−.332** (.14)	−1.829*** (.13)	−.940*** (.14)
4–6 Months after the event	.472*** (.08)	.198*** (.08)	−.306** (.15)	−1.227*** (.13)	−.333** (.17)
7–9 Months after the event	.397*** (.07)	.164** (.08)	.157 (.15)	−.721*** (.14)	−.621*** (.20)
10–12 Months after the event	.338*** (.08)	.245*** (.09)	.248* (.16)	−.842*** (.15)	−.386** (.22)
12 Months					
Within last 12 months	.366*** (.05)	.183*** (.07)	−.088 (.08)	−1.214*** (.072)	−.615*** (.08)
Same for both approaches					
2 Years after the event	.218*** (.05)	−.139** (.06)	.099 (.09)	−.363*** (.07)	−.283** (.14)
3 Years after the event	.075 (.05)	−.189** (.07)	.110* (.10)	−0.209* (.08)	.192 (.17)
4 Years after the event	.165* (05)	−.198** (.07)	.143 (.11)	.006 (.08)	.017 (.21)
5 Years after the event	.088 (.05)	−.181* (.05)	.314*** (.12)	.052 (.09)	.282 (.23)
Controls					
Employment status					
1. Employed[a]	–	–	–	–	–
2. Unemployed	−.389***	−.379***	.387***	−.394***	−.344***
Marital status					
1. Never married[a]	–	–	–	–	–
2. Cohabiting	−.263***	−.143***	−.202***	−.158***	−.176***
3. Married	–	.179***	.163***	.223***	.197***
4. Divorced	.015	.124***	–	.173***	.155***
5. Widowed	−.375***	−.205***	−.227***	–	−.197***
Partner's employment status					
1. Employed[a]	–	–	–	–	–
2. Unemployed	−0.052**	−.062***	−.043**	−.052**	−.068***
Age	−.050***	−.048***	−.049***	−.050***	−.051***
Years of education	.010***	.012***	.009**	.009***	.007*
No. of children	−.017*	−.039***	−.039***	−.042***	−.045***
Log household net income	.005***	.005***	.005***	.005***	.005***
Health status	−.008***	−.008***	−.008***	−.080***	−.008***
Male	−.059**	−.054*	−0.042	−.06**	−.054*
Wave dummies	Yes	Yes	Yes	Yes	Yes
Constant	6.464*** (.09)	6.799*** (.09)	6.817*** (.09)	6.839*** (.09)	6.844*** (.09)

Table 3 continued

Precision of temporal localization	Marriage	Birth of child	Divorce	Widowhood	Unemployment
R^2 (within, between, overall)	.04/.09/.09[b]	.04/.09/.09	.04/.08/.08	.04/.08/.09	.04/.08/.08
Wald χ^2	4955.53***	4477.54***	4860.16***	5248.30***	4497.56***
Rho	.433	.429	.435	.435	.441

The Mundlak model

Standard errors in parentheses

*** Significant at 0.01; ** Significant at 0.05; * Significant at 0.1

[a] Omitted categories

[b] The amount of variance explained by the regression models is not very large; however, the Wald-test has high values in all models, which means that the regressions are significant (Ratnikova 2006)

around 6 months after the divorce. At that point life satisfaction differs significantly from the initial reaction: Z = 2.4** (when compared to 7–9 months) and Z = 2.9** (when compared to 10–12 months). The initial reaction does not differ from that of the second quarter, and, again, the second quarter differs from two subsequent ones (Z = 2.3** when compared to the 3rd quarter; Z = 2.8** when compared to the 4th quarter). Importantly, there are no differences between the quarter immediately preceding marital dissolution and the initial reaction.

The SWB dynamics after becoming unemployed is also rather intense. There seems to be a threshold after the first 3 months (Z = 2.76**), as the three other quarters (2nd–4th) do not differ from each other. Quarterly estimates for unemployment should be interpreted with caution, however, because of highly unequal cell sizes. Frequencies of unemployment are distributed unevenly across the year because of seasonal variations. Note that SOEP interviews have been mostly conducted during March and May. As a result, the group representing the last quarter (10–12 months after losing a job) has a rather small number of respondents. Nevertheless, unemployment remains a negative experience throughout the first year.

4 Discussion

The purpose of this study was first to test whether the precision with which life events were temporally localized made a difference in terms of the observed SWB trajectories of adaptation. Secondly, the hypothesis was tested that the temporal resolution played an important role for negative but not for positive life events. The results by and large confirmed the hypotheses of the study.

Indeed, two clusters of events were distinguished with regard to the SWB volatility within the first year after the event. The first group comprises two positive events, marriage and birth of child. The second one contains three negative experiences—divorce, widowhood, and unemployment. For negative events, such as widowhood, divorce, or unemployment, the yearly resolution distorts the observed SWB trajectory and leads to an underestimation of the effect. In contrast, the yearly resolution yields accurate results on the adaptive process for positive experiences, such as marriage and birth of child.

The findings are in line with the protection model, which links SWB dynamics with protective potential of certain statuses (i.e., being married, being employed) and available

Table 4 Anticipatory adaptation to life events (comparing quarterly and yearly precision in temporal localization)

Precision of temporal localization	Marriage	Birth of child	Divorce	Widowhood	Unemployment
3 Months					
1–3 Months before the event	0.414*** (.10)	.413*** (.09)	−.279** (.17)	−.743*** (.15)	−.345*** (.15)
4–6 Months before the event	.212** (.09)	.283*** (.10)	−.127 (.17)	−.407*** (.15)	−.301*** (.14)
7–9 Months before the event	.248** (.11)	.244** (.10)	−.587*** (.15)	−.314** (.13)	−.294** (.14)
10–12 Months before the event	.277** (.13)	.047 (.11)	−.384*** (.14)	−.571*** (.15)	−.133 (.24)
12 Months					
12 Months before the event	.270*** (.06)	.251** (.07)	−.398*** (.07)	−.477*** (.08)	−.289*** (.11)
Same for both approaches					
2 Years before the event	.129** (.06)	.005 (.07)	−.467*** (.07)	−.259*** (.08)	−.103 (.11)
3 Years before the event	.087 (.06)	.005 (.08)	−.300*** (.07)	−.114 (.08)	−.056 (.13)
4 Years before the event	.103 (.06)	.006 (.07)	−.268*** (.07)	−.104 (.08)	−.042 (.13)
Controls					
Employment status					
1. Employed[a]	–	–	–	–	–
2. Unemployed	−.348***	−.381***	−.380***	−.380***	–
Marital status					
1. Never married[a]	–	–	–	–	–
2. Cohabiting	−.069	−.103***	−.144***	−.163***	−.151***
3. Married	.139**	.236***	.203***	.198***	.178***
4. Divorced	.351***	.164***	.161***	.149***	.243***
5. Widowed	−.159**	−.156***	−.178***	−.275***	−.193***
Partner's employment status:					
1. Employed[a]	–	–	–	–	–
2. Unemployed	−0.42**	−.076***	−.041**	−.062**	−.064***
Age	−.044***	−.049***	−.051***	−.050***	−.050***
Years of education	.002	.009**	.010***	.006	.009*
No. of children	−.007	−.046***	−.037***	−.037***	−.045***
Log household net income	.005***	.005***	.005***	.005***	.005***
Health status	−.008***	−.008***	−.008***	−.008***	−.007***
Male	−.050	−.041	−.033	−.057**	−.034
Wave dummies	Yes	Yes	Yes	Yes	Yes
Constant	7.172*** (.11)	7.151*** (.11)	7.175*** (.10)	6.855*** (.10)	7.175*** (.11)
R^2 (within, between, overall)	.03/.09/.09	.04/.10/.09	.04/.08/.08	04/.10/.08	.04/.07/.07
Wald χ^2	2795.75***	3993.47***	4857.64***	4197.03***	3259.94

Table 4 continued

Precision of temporal localization	Marriage	Birth of child	Divorce	Widowhood	Unemployment
Rho	.447	.425	.440	.460	.451

The Mundlak model

Standard errors in parentheses

*** Significant at 0.01; ** Significant at 0.05; * Significant at 0.1

[a] Omitted categories

resources. Loss of protective status deprives an individual from important well-being sources, thereby producing strong reaction. Negative experiences, such as divorce,[16] unemployment and widowhood severely deplete personal resources; the gap between the equilibrium state of SWB and the current state is especially big at the time of the event. Thus, these events require more intensive coping efforts in order to reestablish SWB equilibrium. Differences in initial reaction to positive and negative events could be also interpreted from the point of prospect theory that implies bigger impact of losses than of gains on behavior, well-being and decision-making (Kahneman and Tversky 1984). In the following negative and positive events are discussed in detail and in turn.

For divorce, widowhood and unemployment the initial SWB reaction was found to be about twice as strong as might have been judged on the basis of the yearly resolution. Only in the case of widowhood, however, we also observed an overestimation of reaction during the second half of the year following the event. The yearly estimates, which average across the whole year, conceal this dynamics.

The obtained trajectory for divorce complies with existing findings; it is reported, for example, that individuals experience the greatest level of stress prior to making the decision to separate, and much lower stress following the final separation (Kitson and Morgan 1990). Due to these findings, divorce is sometimes interpreted as a positive solution for a marriage of poor quality. This is a valid conclusion, as life satisfaction not only reverts to baseline, but the effect turns to be positive even at the end of the very first year after the divorce. However, the eventual positive effect is not immediate: the first 6 months after the divorce are no better than (presumably) the time between the actual decision to separate and the divorce itself; all in all, SWB does not change much between two measurements 12 months apart during which the divorce takes place.[17] Thus, applying the yearly temporal resolution to divorce, makes us overlook the significant dip in life satisfaction around the event and therefore increases the risk of the incorrect conclusion that divorce has, on average, no negative effects on SWB.

Patterns of SWB dynamics differ among negative events, too. In the case of widowhood the trajectory is more volatile than in the cases of divorce and unemployment (i.e., in case of widowhood all quarters differ from each other, except for the two last ones). Several explanations for these differences can be offered. First, it is plausible that loss of partner

[16] Even though divorce might be the exit from an unhappy marriage, its short-term consequences, as well as the period of anticipation, are associated with lower life satisfaction.

[17] This brings us to the question whether events as discrete points are good markers of a critical loss or gain: if an event as such is a critical marker of change in SWB, how wide are the time brackets that limit the initial reaction?.

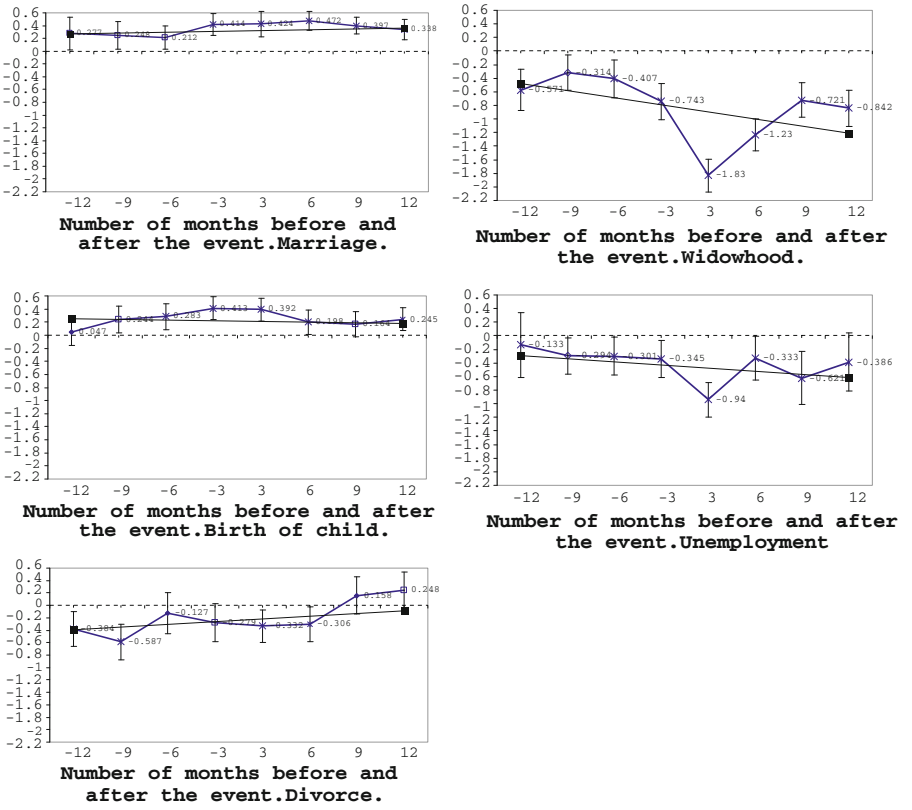

Fig. 1 Effect of life events on life satisfaction. The *thick line* depicts the model with quarterly precision, the *thin line* the one with yearly timing. Unstandardized regression coefficients are shown on the y-axis. The *dashed horizontal line* reflects the baseline well-being, and might be interpreted as the level of satisfaction if an event had no effect at all. *Vertical bars* depict confidence intervals significant differences from baseline levels: *times symbols* significant at 1%, *white box* significant at 5%, *white diamond* significant at 10%

produces a more uniform mourning reaction than marital dissolution.[18] In the latter case inter-individual differences are larger because divorce can be voluntary or involuntary; thus, some individuals can experience a relief rather than grief. With our methodology, however, we conceal inter-individual differences by averaging across the whole sample; it might be the case that high variability in short-term reaction to divorce results in less volatile averaged trajectory. Second, besides valence, other characteristics of events, such as predictability, can moderate the SWB dynamics. Some events can be foreseen better than others. Even though people might anticipate all negative events in question and studies provide empirical support for that (e.g., Clark et al. 2008), there is more certainty with regard to the exact timing of divorce (especially since in this study we focus on formal divorce) rather than of unemployment and widowhood.[19] As discussed above, uncertainty

[18] Even though, improvement in SWB can also be observed right after death of the partner; usually, such trajectory is characteristic for cases of long-term care.

[19] Although there are highly predictable cases of caring for a sick partner, as mentioned above, uncertainty regarding the exact timing of the loss still persists.

Table 5 Comparing the two approaches: Z-scores (significance of differences between regression coefficients of the quarterly and the yearly models)

	Marriage	Birth of child	Divorce	Widowhood	Unemployment
Anticipation					
1–3 Months before	−0.8	−1.2	0.7	1.7	0.5
4–6 Months before	0.6	−0.2	0.4	0.9	0.07
7–9 Months before	0.4	0.8	2.3***	−0.4	0.3
10–12 Months before	0.01	0.6	1.1	1.2	0.4
Reaction					
1–3 Months after	−0.35	−1.4	2.85***	2.9***	1.16
4–6 Months after	1.39	0.5	1.63	1.2	1.74*
7–9 Months after	0.55	0.8	−0.94	2.4***	0.2
10–12 Months after	0.39	0.6	0.12	1.93**	0.61

*** Significant at 0.01; ** Significant at 0.05; * Significant at 0.1

hardly allows for anticipatory coping. We argue that the more an event is likely to be anticipated, the less it appears to be a marker of well-being dynamics; in other words, the reaction at the time of experiencing a highly predictable event should not differ from the reaction averaged across a much longer time span (e.g., 1 year). On contrary, events that are harder to anticipate shatter well-being at the time of the experience, and the reactive coping efforts are condensed rather than distributed across a longer time span. In other words, anticipatory coping allows smoothening the transition, since it minimizes the degree of affective intensity experienced at the occurrence of the event.

Positive events elicit less volatility in SWB dynamics. As these experiences are not depleting resources, but are rather enriching resources (especially, marriage), they do not signal any potential threat to optimal functioning or survival via a strong initial reaction. It is noteworthy, however, that birth of a child, albeit initially positive, in the long run affects life satisfaction negatively, perhaps, because it is a resource-demanding event, at least, in first few years.

It is also plausible that other characteristics of the event, such as predictability and compliance with social norms, contribute, alongside of positive valence, to shaping of a gently sloping SWB trajectory. Both marriage and birth of child are highly socially approved, normative events, which are easy to make sense of. Compliance of an event or action with a social norm supposedly makes explanation easier, thus, according to the AREA model (Wilson and Gilbert 2008) normative events should produce a 'smoother' reaction. Both events are highly predictable, as well, which means that the coping efforts are distributed across a longer time span.

4.1 Implications for Future Research

One of the crucial questions in adaptation research is what are the predictors of adaptation trajectory? Identification of events on the quarterly basis may contribute to the literature by providing a more precise picture of the SWB dynamics. Firstly, the trajectory, which is based on averaging across a 1 year timespan, might conceal diverse patterns. Thus, if the initial reaction to an event is underestimated due to crude measurement, certain patterns of reaction may be overlooked. Secondly, different resources may operate at different stages

of adaptation; for instance, it might be that self-regulation skills are very important immediately after losing a partner, whereas after 10 months sufficient financial resources matter more. Certain events, such as divorce and widowhood, are characterized by high volatility of SWB within the first year of experience. If we neglect these dynamics, we are likely to overlook important predictors that might play a role in the very early stages of coping with new experience and subsequently lose their significance.

4.2 Limitations

As usual there are a number of limitations that need to be considered when evaluating the findings of the present study. One limitation of this study is that the measure of life satisfaction is only available on a yearly basis. Therefore, we were not able to trace individuals' life satisfaction, as they move from the 1st quarter after the event to the 2nd quarter, and so on. Even though the methods of panel data analysis, which allow controlling for the unobserved heterogeneity were implemented, unavailability of more frequent measures of SWB makes it impossible to trace the complete adaptation process at a higher temporal resolution.

Another limitation is that in some cases the *formal* aspect of a critical life event, such as the date of actually getting legally married or divorced, which is the date identified in the SOEP data set, is not necessarily the best marker in terms of SWB dynamics. These formal events might be preceded by more or less extended periods of cohabitation or separation, and, therefore, represent only an approximation to the "turning point" in the actual adaptation process. In these cases other points in this process, such as the start of cohabitation or separation, might add to our knowledge about the SWB dynamics related to marriage or divorce. Nevertheless, we used the formal status passages as usually is the case in the literature, which mostly investigates the formal transitions. However, inclusion of informal transitions would definitely enrich our insight into adaptation process.

5 Conclusion

Individual choices, along with personality and context, are an important influence on subjective well-being. The probability of a certain choice and their outcomes certainly depend on the personal and contextual resources available to the individual. While making an attempt to estimate the effect of a choice/event on SWB and trace it in the short- and long-run, temporal distance since the event should be such that it allows to outline a precise trajectory of the adaptation process. This paper made an attempt to answer the question whether it is justified to apply the same timing scale for all events in order to grasp all important characteristics of the adaptation process. We conclude that events differ by the degree of SWB sensitivity to the temporal distance since an experience. Implementation of the same measurement scale for all events, regardless their properties, may lead to a distortion of the observed pre- and post-event trajectory of life satisfaction.

Acknowledgments Preparation of this manuscript was carried out as a part of the doctoral work of the first author within the graduate program of the Bremen International Graduate School of Social Sciences (BIGSSS; funded by the German Research Foundation DFG). We thank Reinhard Schunk and Liuben Siarov for their comments on the analytic strategy of the study. We also wish to acknowledge helpful comments received during the review process.

Appendix 1

See Table 6.

Table 6 The distribution of life satisfaction ratings in the SOEP subsample of western Germans, 1984–2007

Score	Frequency	Percent
0	677	0.56
1	530	0.44
2	1,449	1.20
3	2,919	2.42
4	4,169	3.45
5	13,993	11.59
6	12,510	10.36
7	24,971	20.68
8	36,881	30.54
9	13,752	11.39
10	8,410	6.96
Total	120,747	96.60

Appendix 2

See Table 7.

Table 7 Adaptation to life events

	Marriage	Birth of child	Divorce	Widowhood	Unemployment
Anticipation stage					
1–3 Months before	.345*** (.09)	.484*** (.09)	−.263** (.16)	−.814*** (.149)	−.324*** (.13)
4–6 Months before	.214** (.10)	.257** (.11)	−.120 (.17)	−.446*** (.154)	−.288*** (.14)
7–9 Months before	.204** (.11)	.201* (.11)	−.585*** (.15)	−.312** (.148)	−.307** (.13)
10–12 Months before	.254* (.14)	.090 (.11)	−.379*** (.14)	−.616*** (.162)	−.237 (.23)
Within 1 year	.240*** (.061)	.282** (.08)	−.385*** (.074)	−.490*** (.079)	−.240* (.130)
1–2 Years before	.100* (.060)	.083 (.08)	−.457*** (.069)	−.279*** (.078)	−.281** (.119)
2–3 Years before	.068 (.060)	.061 (.08)	−.303*** (.071)	−.127* (.077)	−.084 (.134)
3–4 Years before	.086 (.061)	.022 (.09)	−.272*** (.074)	−.114 (.077)	.052 (.132)
Adaptation stage					
1–3 Months after	.423*** (.105)	.357*** (.085)	−.325** (.139)	−1.832*** (.132)	−.917*** (.143)
4–6 Months after	.474*** (.084)	.209** (.083)	−.306** (.153)	−1.225*** (.127)	−.406** (.176)

Table 7 continued

	Marriage	Birth of child	Divorce	Widowhood	Unemployment
7–9 Months after	.399*** (.073)	.173** (.086)	.317* (.165)	−.725*** (.141)	−.622*** (.201)
10–12 Months after	.338*** (.087)	.233*** (.088)	.311** (.155)	−.844*** (.148)	−.322 (.226)
Within 12 months	.375*** (.045)	.221*** (.08)	−.084 (.082)	−1.219*** (.072)	−.606*** (.086)
2 Years after	.220*** (.049)	−.117** (.07)	.100 (.10)	−.370*** (.076)	−0.270* (0.143)
3 Years after	.078 (.051)	−.168** (.08)	.109 (.103)	−.208*** (.081)	0.190 (0.171)
4 Years after	.169* (.053)	−205** (.08)	.141 (.113)	.011 (.085)	0.0124 (0.206)
5 Years after	.091 (.06)	−.172* (.07)	.315** (.125)	.051 (.092)	0.273 (0.230)

The fixed effects model

Standard errors in parentheses

*** Significant at 0.01; ** Significant at 0.05; * Significant at 0.1

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