



# Does personality moderate reaction and adaptation to major life events? Analysis of life satisfaction and affect in an Australian national sample <sup>☆</sup>



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## ABSTRACT

We used a nationally representative panel of Australian households to replicate a study by Yap et al. (2012) that evaluated how life satisfaction changed following major life events and the extent to which personality moderated those changes. We replicated the protective function of marriage but found that long-term declines that follow widowhood mostly reflect normative changes. In addition, we found that people reported slight decreases in positive affect following marriage and childbirth, an increase in positive affect following widowhood, and a slight increase in negative affect following childbirth, relative to normative trajectories. The Big Five did not moderate response to life events in a way that is consistent with past theory and research.

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## 1. Introduction

Researchers interested in the association between life events and subjective well-being have evaluated these associations longitudinally using data from large, nationally representative panel studies. Such data allow for powerful methods of evaluating the effects of life events on SWB and are advantageous because of their extremely large sample sizes, long time spans, and the prospective nature of the data (allowing pre-to-post event comparisons of SWB). Results from these longitudinal studies suggest that the degree of adaptation following a life event depends on the event and that some life events (e.g., disability; Lucas 2007a) are associated with lasting changes in SWB (see Lucas, 2007b for a review).

New research has extended these investigations by evaluating the factors that account for variability in patterns of reactions and adaptation to life events. For instance, Yap et al. (2012) examined whether the Big Five traits (extraversion, neuroticism, conscientiousness, agreeableness, and openness) moderated responses to a variety of life events in the British Household Panel Survey (BHPS). The study's main goals were to evaluate how major life events affected SWB, and to explore whether the Big Five accounted for variability in responses to these life events. Results showed that the Big Five did not moderate changes in life satisfaction that followed the experiences of life events in any consistent pattern in the BHPS, and none of the handful of moderating effects of personality that had been reported in the literature at that time were replicated (i.e., Boyce & Wood, 2011; Boyce, Wood, & Brown, 2010). However, several unexpected associations with personality were observed and the next important step is to evaluate whether these findings can be replicated in other samples.

The aim of the current study was to replicate the study by Yap et al. (2012) using a national sample of households in Australia. In addition to evaluating the effects of life events on life satisfaction, we extend previous research by evaluating the impact of life events on positive and negative affect (which was not measured in the BHPS and other panel datasets that have been used in the past research on life events). This is an important extension as much of the prior work that evaluated the role of personality on reactions to positive and negative stimuli examined affect as a primary outcome (e.g., Larsen & Ketelaar, 1989; Larsen & Ketelaar, 1991).

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## 2. Method

### 2.1. Sample characteristics

We obtained the data used in these analyses from the Household, Income, and Labour Dynamics in Australia Survey (HILDA). The HILDA is a longitudinal study of nationally representative households in Australia that started in 2001 and is ongoing, with data collected on a yearly basis. Households were selected using a multi-stage approach, with households randomly selected from a randomly selected set of Australian districts. All household members 15 years of age or older are asked to participate in the study. The average annual attrition rate was 7%. Detailed information about survey characteristics and sampling methods can be found in the HILDA User Manual (Summerfield et al., 2012). For our analyses we used the first 10 waves of the study.

#### 2.1.1. Sample selection

We followed Yap et al.'s (2012) method for selection of samples of people who experienced major life events. For the marriage sample we selected people who reported never being married at the beginning of the study, but who got married at some point and stayed married for the remainder of the study. The childbirth sample included individuals who reported having their first child at some point during the study. In the widowhood sample we included people who reported being married at the start of the study, but whose spouse died at some point in the study following which they did not remarry during the remainder of the study. The unemployment sample included individuals who experienced at least one unemployment bout during their participation in the study. In all samples we retained only those individuals who rated their life satisfaction (or affect in the analyses involving positive and negative affect) at least once before and once after experiencing the event. Information about sample sizes and demographic characteristics of these samples is shown in Table 1.

#### 2.1.2. Selection of comparison groups

We selected the control samples of people who did not experience particular life events in the same manner as Yap et al. (2012). Namely, we selected groups of people who, during the study, remained unmarried (marriage control), remained childless (childbirth control), remained married (widowhood control), and did not experience a bout of unemployment (unemployment control). We used the propensity score matching technique (Gelman & Hill, 2009) to make event and control groups similar on age, age squared, gender, log-transformed household income, and education. We did this using the matching function of the arm package (Gelman et al., 2011) of the R statistical software (R Development Core Team, 2010).

### 2.2. Measures

#### 2.2.1. Life satisfaction

Life satisfaction was measured at each wave with the question "All things considered, how satisfied are you with your life?"

(0 = Totally dissatisfied, 10 = Totally satisfied). To establish a common metric of change in life satisfaction across different analyses, we fit an intercept-only multilevel model to all available life satisfaction data ( $N = 21,269$ ). The model estimated average life satisfaction to be 7.91, with the within-person standard deviation of 1.07 and the between-person standard deviation of 1.10. To make our results with different events comparable, and to make the results comparable to the Yap et al. (2012) study, we will use this between-person standard deviation as a metric of life satisfaction change.

#### 2.2.2. Affect

Positive and negative affect were assessed at each wave of the study. All questions started with a stem "How much of the time during the past 4 weeks..." and people made their ratings on a 6-point scale (1 = All of the time, 6 = None of the time). Positive affect items were "Did you feel full of life?", "Have you felt calm and peaceful?", "Did you have a lot of energy?", and "Have you been a happy person?". Negative items were "Have you been a nervous person?", "Have you felt so down in the dumps nothing could cheer you up?", "Have you felt down?", "Did you feel worn out?", and "Did you feel tired?". Items were reverse-scored as appropriate and aggregated into positive and negative affect scales so that higher scores indicated more frequent experience of affect. Again, in order to be able to compare across the events we used estimated between-person standard deviations of positive and negative affect scores obtained by fitting intercept-only multilevel models to the data. The average positive affect was 4.07, the within-person standard deviation was 0.65, and the between-person standard deviation was 0.78. For negative affect the estimated average was 2.37, the within-person standard deviation was 0.55, and the between-person standard deviation was 0.66.

#### 2.2.3. Personality

Personality was measured in 2005 with a 36-item inventory obtained from Saucier's (1994) set of adjectives. People were asked how well each of the adjectives described them (1 = Does not describe me at all, 7 = Describes me very well). The inventory was further reduced to obtain the five-factor solution (see Summerfield et al., 2012, pp. 54–55 for details). In the end, neuroticism items were: envious, moody, touchy, jealous, temperamental, fretful ( $\alpha = .80$ ); extraversion items were: talkative, bashful, quiet, shy, lively, extroverted ( $\alpha = .74$ ); openness to experience items were: deep, philosophical, creative, intellectual, complex, imaginative ( $\alpha = .73$ ); agreeableness items were: sympathetic, kind, cooperative, warm ( $\alpha = .78$ ); and conscientiousness items were: orderly, systematic, inefficient, sloppy, disorganized, efficient ( $\alpha = .78$ ). Correlations among the Big Five in the overall sample and the means and standard deviations in the overall sample and the event samples can be found in the On-line Supplement for this article.

### 2.3. Analytic approach

#### 2.3.1. Modeling changes in life satisfaction – replication of Yap et al. (2012)

We followed Yap et al.'s (2012) method for modeling data over time. For analyses involving life satisfaction we created three models.<sup>1</sup> The first model was a basic nonlinear model that estimated baseline level of life satisfaction, peak change in life satisfaction in the year of the event, and long-term change in life satisfaction in

**Table 1**  
Demographic characteristics of the event samples.

	Marriage	Childbirth	Widowhood	Unemployment
% Women	51.2	51.0	70.8	53.5
Age at event <i>M</i> ( <i>SD</i> )	31.7 (8.9)	30.2 (7.1)	72.0 (11.0)	31.9 (14.1)
<i>N</i>	1,370	1,137	298	1,438
Waves before event	3.8	4.7	4.6	3.0
Waves after event	4.2	4.0	4.3	5.2

<sup>1</sup> Detailed information about all models can be found in the On-line Supplement.

the years after the event, as well as nonlinear pre- and post-event rates of changes in life satisfaction.

The second model included control groups of people who did not experience a particular life event. This model adjusts the nonlinear trajectory of life satisfaction described above to include normative changes that occur in both event and control groups. Given this information, it is possible to estimate the predicted life satisfaction trajectory that people in the event group would have taken if they did not experience the event but continued to experience normative changes in life satisfaction. The most important parameters of this model are: first year (life satisfaction in the first year of study), peak change (difference between actual life satisfaction in the year of event and predicted life satisfaction had the event not taken place), asymptote change (difference between actual long-term life satisfaction level and predicted level had the event not taken place). The model also estimates pre- and post-event nonlinear rates of change for the event and yearly change (normative change in life satisfaction) at the within-person level, and a group effect that reflects any pre-existing differences between people who went on to experience the event and those who did not at the between-person level.

The third model included personality moderators of baseline life satisfaction and change in life satisfaction that occurs after the event. For these analyses we selected only individuals who rated their personality prior to experiencing the event, in order to avoid confounding moderating effects of personality on changes following life events with effects of life events on personality. This reduced our sample sizes to 548 (marriage), 651 (childbirth), 133 (widowhood), and 430 (unemployment). Because of the reduced number of waves and sample sizes, for analyses involving personality we used a simpler model to model life satisfaction over time. This model includes three within-person parameters: baseline (average level in the years prior to the event), event-year change (change from baseline in the year of the event), and post-event change (change from baseline in the years following the event). For each event we estimated five models, with one of the Big Five traits moderating baseline, event-year change, and post-event change in each model.

### 2.3.2. Modeling changes in affect

As an extension of Yap et al.'s (2012) study, we explored changes in affective experiences that follow major life events. Our examination of raw means suggested that, unlike life satisfaction, affect scores often did not follow nonlinear trajectories, and we were not able to fit nonlinear models to these data. Thus, for analyses involving affect variables, we used slightly different models that have been used in past research (e.g., Lucas, Clark, Georgellis, & Diener, 2003).

The first model divided the time course into three time periods: baseline period (years up to and including two years prior to the event), reaction period (year before, year of, and year after the event), and adaptation period (all subsequent years). This model estimated baseline affect (average level during the baseline period), average change from baseline in the reaction period, and average change from baseline in the adaptation period. The second model was similar to the first, but included control groups and used the same logic as the second nonlinear model. Thus, we estimated yearly linear change in affect that was common to both groups, and the group effect that reflected pre-existing differences between the event and control groups. The reaction and adaptation estimates in this model are made relative to the normative trajectory, and the intercept reflects affect for the event group participants in the first year that they were in the study. The third model included personality variables as moderators of initial level and change in affect and was identical to the model we used for testing personality moderators of change in life satisfaction.

## 3. Results

### 3.1. Replication of Yap et al. (2012)

Fig. 1 shows changes in life satisfaction following marriage, childbirth, widowhood, and unemployment. The model estimates from these analyses can be found in Table 2.

#### 3.1.1. Marriage

We replicated Yap et al.'s (2012) finding that people reported increases in life satisfaction around the time of marriage, but then returned to their baseline levels in the years that followed (see Table 2). Average life satisfaction prior to marriage was 7.55. Participants reported an increase of 0.58 points (0.53 standard deviations) from baseline in the year of marriage, but their long-term life satisfaction levels were not significantly different from zero.

We also replicated the protective effect of marriage observed in Yap et al.'s (2012) study. The linear change estimate shows a normative decline of 0.03 points per year – this is how life satisfaction would have changed if people remained unmarried. However, those who got married reported life satisfaction that was 0.41 points (0.37 standard deviations) higher in the year of marriage than this trajectory predicts. In addition, their long-term life satisfaction was 0.27 points (0.25 standard deviations) higher than it would have been if they had not married.<sup>2</sup> Thus, people are more satisfied in marriage than they would have been if they remained single, because if they had remained single their life satisfaction would have dropped below their baseline levels.

#### 3.1.2. Childbirth

In the BHPS data, Yap et al. (2012) found that people received a brief boost in life satisfaction around the time of birth of their first child, but that their long-term levels were no different from baseline. We found the same results in the HILDA. People reported an increase of 0.23 points (0.21 standard deviations) from baseline in the year of birth of their first child, but long-term life satisfaction levels were not different from where they were at baseline. As in Yap et al.'s (2012) study, even after accounting for normative declines, long-term life satisfaction levels of people who went on to become parents were not different from where they would have been if they had remained childless.

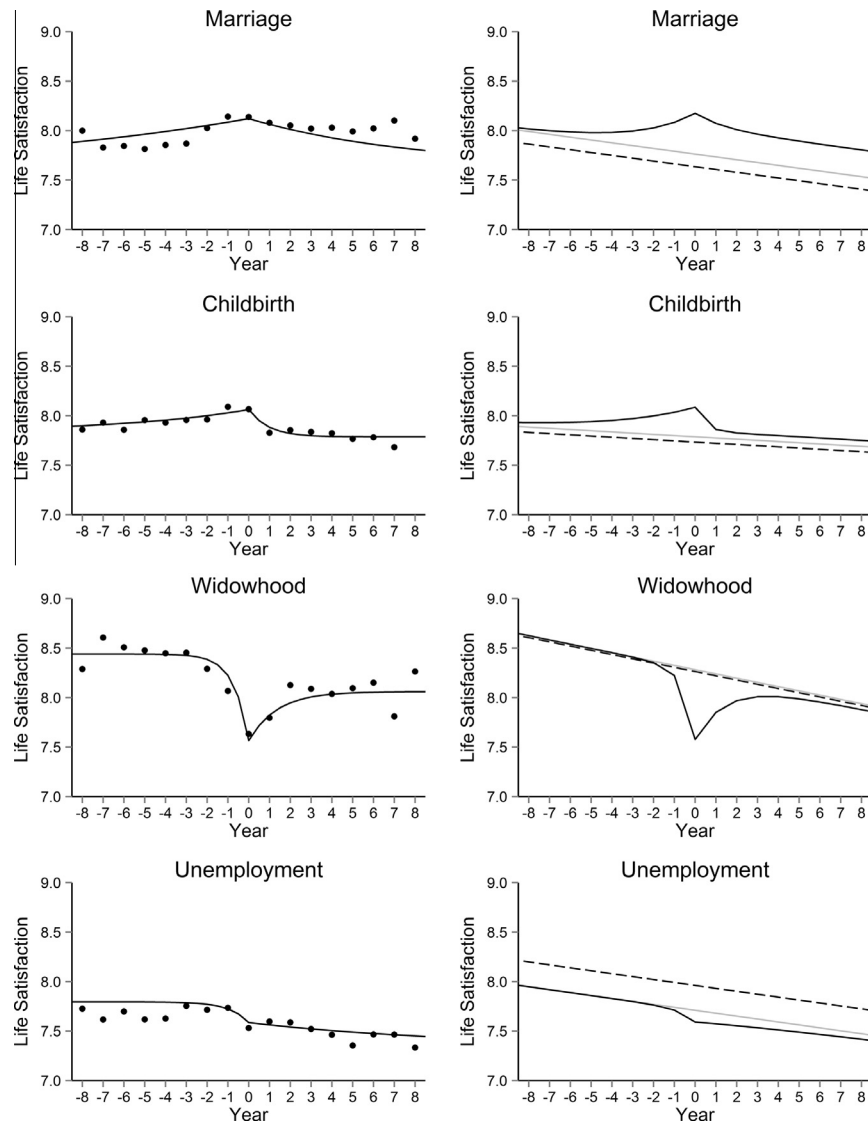
#### 3.1.3. Widowhood

As in the BHPS sample, widows and widowers reported lower life satisfaction in the year in which their spouse died (0.87 points, or 0.79 standard deviations) and in the years that followed (0.38 points, or 0.35 standard deviations). However unlike in the BHPS, the long-term drop in life satisfaction following widowhood did not persist after accounting for normative declines in this dataset. Thus, in this sample, majority of the decline in life satisfaction that occurs following death of spouse can be attributed to normative declines that would have occurred regardless of the experience of widowhood.

#### 3.1.4. Unemployment

The results of Yap et al.'s (2012) study suggested that although people reported a drop in life satisfaction following an unemployment bout, this drop seemed to reflect normative

<sup>2</sup> Fig. 1 suggests that the nonlinear model may be biased because the predicted lines do not precisely match up with raw data means. We followed up on this by fitting simpler models to life satisfaction data – the reaction-adaptation models which we also specified for the affect variables. In this case, the estimates matched the means. However, the conclusions were identical – life satisfaction after marriage was no different than prior to marriage, but it was higher than it would have been had the participants remained single (after accounting for the normative declines in life satisfaction over time).



**Fig. 1.** Estimated trajectories of life satisfaction from traditional models (left panel) and models that included normative changes over time (right). Points indicate raw means of life satisfaction of people who experienced a major life event. Solid black lines show estimated trajectories in event groups. Dashed lines show estimated trajectories in control groups. Solid gray lines estimate what the trajectories would be for people who experienced a major event if they did not go on to experience the event.

**Table 2**

Results from the nonlinear models fit to life satisfaction data.

	Marriage	Childbirth	Widowhood	Unemployment
<i>Basic model</i>				
Baseline asymptote	7.55* (0.12)	7.84* (0.06)	8.44* (0.09)	7.79* (0.05)
Peak change	0.58* (0.13)	0.23* (0.07)	−0.87* (0.13)	−0.21* (0.05)
Asymptote difference	0.08 (0.16)	−0.05 (0.07)	−0.38* (0.12)	−0.45* (0.11)
Pre-event change	0.06* (0.01)	0.15* (0.02)	0.75* (0.05)	0.67* (0.04)
Post-event change	0.12* (0.03)	0.65* (0.12)	0.52* (0.06)	0.10* (0.01)
<i>With control groups</i>				
First year	7.87* (0.07)	7.85* (0.11)	8.48* (0.08)	7.80* (0.04)
Peak change	0.41* (0.07)	0.30* (0.11)	−0.71* (0.13)	−0.12* (0.05)
Asymptote difference	0.27* (0.09)	0.06 (0.13)	−0.06 (0.12)	−0.02 (0.11)
Pre-event change	0.29* (0.08)	0.21 (0.13)	0.86* (0.05)	0.76* (0.04)
Post-event change	0.52* (0.10)	0.90* (0.12)	0.49* (0.05)	0.11* (0.01)
Yearly change	−0.03* (0.00)	−0.01* (0.00)	−0.04* (0.01)	−0.03* (0.00)
Group	−0.13 (0.08)	−0.05 (0.12)	−0.02 (0.11)	0.25* (0.05)

Notes: Group: 0 = event, 1 = control.

\*  $p < .05$ .

declines over time. We replicated this finding with the HILDA sample. People reported lower life satisfaction both during the unemployment bout (drop of 0.21 points, or 0.19 standard deviations, from baseline) and afterwards (drop of 0.45 points, or 0.41 standard deviations, from baseline). However, these long-term changes seem to reflect normative changes in life satisfaction during this period, and the long-term levels of well-being were not significantly different from the expected trajectory that models only normative declines.

### 3.1.5. Personality as a moderator of change in life satisfaction

Yap et al. (2012) also evaluated whether personality traits moderated short- and long-term changes in life satisfaction following the experience of major life events. Although their study replicated robust associations of personality and life satisfaction at baseline, they failed to find consistent associations with change across positive and negative events. However, four significant but unpredicted associations emerged. First, more agreeable people reported less satisfaction with their lives following marriage, relative to baseline.

Second, higher openness to experience was associated with a more positive reaction to childbirth. Third, individuals scoring higher on neuroticism received greater long-term boosts in life satisfaction following birth of their first child. Fourth, people higher in agreeableness initially reacted less negatively to unemployment, although long-term adaptation was not associated with agreeableness.

The results of our analyses can be found in Table 3. We replicated general associations between personality and baseline life satisfaction. The only discrepancy from this finding was that in the unemployment sample openness was negatively related and conscientiousness was unrelated to life satisfaction. The openness-life satisfaction association appears to be unique to this dataset, but the lack of relationship with conscientiousness replicates Yap et al.'s (2012) results. It seems that conscientiousness is less important for well-being in individuals who go on to become unemployed. We found only one significant moderating effect of personality on change in life satisfaction that follows the experience of life events. People higher in agreeableness reported more

**Table 3**

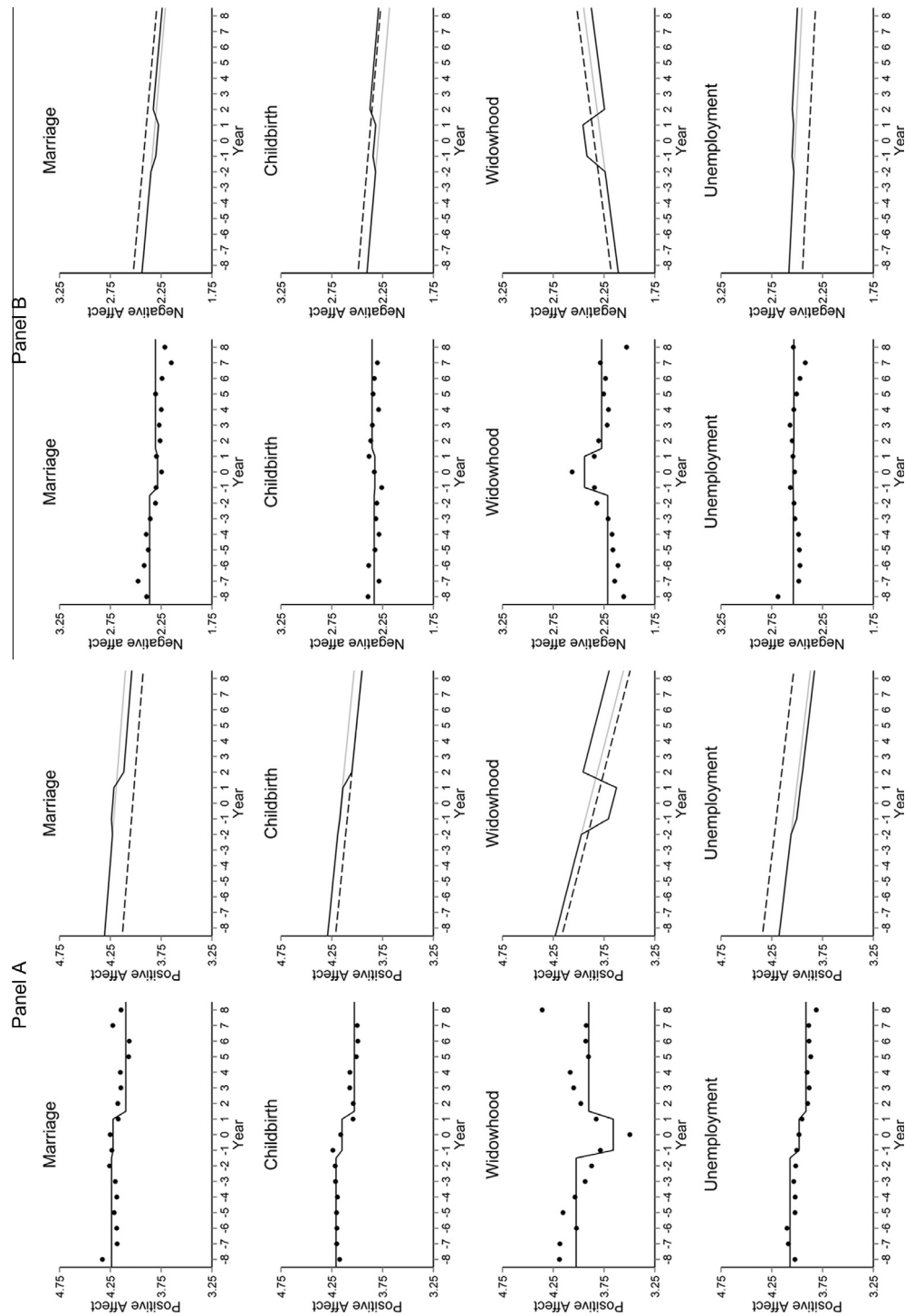
Estimates of baseline life satisfaction, change from baseline in the year of event, and change from baseline in the following years, and the moderating effects of personality on these three parameters.

	N	E	O	A	C
<b>Marriage</b>					
<i>Baseline</i>					
Intercept	7.92* (0.04)	7.92* (0.04)	7.92* (0.04)	7.92* (0.04)	7.92* (0.04)
Personality	−0.17* (0.04)	0.14* (0.04)	−0.03 (0.04)	0.23* (0.05)	0.21* (0.04)
<i>Event year change</i>					
Intercept	0.13* (0.05)	0.13* (0.05)	0.13* (0.05)	0.13* (0.05)	0.13* (0.05)
Personality	0.07 (0.04)	−0.02 (0.04)	−0.01 (0.04)	−0.02 (0.05)	−0.01 (0.05)
<i>Post-event change</i>					
Intercept	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)
Personality	0.01 (0.04)	0.03 (0.04)	−0.04 (0.04)	−0.11* (0.05)	−0.05 (0.04)
<b>Childbirth</b>					
<i>Baseline</i>					
Intercept	7.98* (0.04)	7.98* (0.04)	7.98* (0.04)	7.98* (0.04)	7.98* (0.04)
Personality	−0.27* (0.04)	0.18* (0.04)	−0.01 (0.04)	0.21* (0.04)	0.19* (0.04)
<i>Event year change</i>					
Intercept	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)
Personality	0.03 (0.04)	−0.03 (0.04)	0.01 (0.04)	−0.01 (0.05)	0.03 (0.04)
<i>Post-event change</i>					
Intercept	−0.19* (0.04)	−0.19* (0.04)	−0.20* (0.04)	−0.19* (0.04)	−0.20* (0.04)
Personality	0.05 (0.04)	−0.05 (0.04)	−0.02 (0.04)	−0.05 (0.04)	0.01 (0.04)
<b>Widowhood</b>					
<i>Baseline</i>					
Intercept	8.40* (0.09)	8.40* (0.09)	8.39* (0.10)	8.40* (0.09)	8.40* (0.10)
Personality	−0.40* (0.09)	0.32* (0.10)	−0.03 (0.08)	0.43* (0.10)	0.22* (0.09)
<i>Event year change</i>					
Intercept	−0.82* (0.15)	−0.83* (0.15)	−0.83* (0.15)	−0.83* (0.15)	−0.82* (0.15)
Personality	0.06 (0.15)	−0.14 (0.15)	−0.05 (0.13)	−0.19 (0.17)	0.10 (0.15)
<i>Post-event change</i>					
Intercept	−0.52* (0.16)	−0.53* (0.16)	−0.53* (0.16)	−0.53* (0.16)	−0.53* (0.16)
Personality	0.10 (0.16)	−0.13 (0.17)	0.13 (0.14)	−0.08 (0.18)	−0.09 (0.15)
<b>Unemployment</b>					
<i>Baseline</i>					
Intercept	7.81* (0.06)	7.82* (0.06)	7.82* (0.06)	7.81* (0.06)	7.82* (0.06)
Personality	−0.22* (0.05)	0.16* (0.06)	−0.17* (0.06)	0.18* (0.06)	0.01 (0.06)
<i>Event year change</i>					
Intercept	−0.27* (0.07)	−0.28* (0.07)	−0.28* (0.07)	−0.27* (0.07)	−0.28* (0.07)
Personality	−0.05 (0.06)	0.01 (0.07)	0.11 (0.06)	0.01 (0.07)	0.12 (0.07)
<i>Post-event change</i>					
Intercept	−0.26* (0.06)	−0.27* (0.05)	−0.27* (0.06)	−0.26* (0.06)	−0.27* (0.05)
Personality	−0.05 (0.05)	−0.10 (0.05)	0.02 (0.05)	0.04 (0.06)	0.09 (0.05)

Notes: N = Neuroticism, E = Extraversion, O = Openness to experience, A = Agreeableness, C = Conscientiousness.

\*  $p < .05$ .





**Fig. 2.** Estimated trajectories of positive (Panel A) and negative (Panel B) affect from traditional models (left side of panel) and models that included normative changes over time (right side of panel). Points indicate raw means of affect of people who experienced a major life event. Solid black lines show estimated trajectories in event groups. Dashed lines show estimated trajectories in control groups. Solid gray lines estimated what the trajectories would be for people who experienced a major event if they did not go on to experience the event.

declines in well-being following marriage. Importantly, this finding replicates what [Yap et al. \(2012\)](#) found in the BHPS sample.

### 3.2. Changes in affect following major life events

As can be seen in [Fig. 2](#), changes in affect that accompanied the experience of life events were, with the exception of reaction to widowhood, generally small. Affect trajectories differed in an

important way from life satisfaction trajectories in that the largest changes in affect often did not occur in the year of the event. Rather, positive affect generally showed a continued decline, and negative affect remained relatively stable over time.

Results of our models are presented in [Table 4](#). People reported lower long-term positive affect following both marriage and childbirth (0.14 points or 0.18 standard deviations for marriage, 0.18 points or 0.23 standard deviations for childbirth), and these

**Table 4**

Results from the reaction-adaptation models fit to affect data.

	Positive affect				Negative affect			
	Marriage	Childbirth	Widowhood	Unemployment	Marriage	Childbirth	Widowhood	Unemployment
<i>Basic model</i>								
Baseline	4.24* (0.02)	4.21* (0.02)	4.03* (0.05)	4.07* (0.03)	2.36* (0.02)	2.33* (0.02)	2.21* (0.04)	2.54* (0.03)
Reaction	−0.02 (0.02)	−0.06* (0.02)	−0.37* (0.04)	−0.09* (0.02)	−0.08* (0.02)	−0.01 (0.02)	0.23* (0.03)	0.00 (0.02)
Adaptation	−0.14* (0.02)	−0.18* (0.02)	−0.12* (0.05)	−0.16* (0.03)	−0.06* (0.02)	0.02 (0.02)	0.06 (0.04)	−0.01 (0.02)
<i>With control groups</i>								
First year	4.25* (0.02)	4.23* (0.02)	4.07* (0.06)	4.08* (0.03)	2.37* (0.02)	2.35* (0.02)	2.19* (0.05)	2.54* (0.02)
Reaction	0.02 (0.02)	−0.01 (0.02)	−0.23* (0.05)	−0.04 (0.02)	−0.03 (0.02)	0.04 (0.02)	0.16* (0.04)	0.03 (0.02)
Adaptation	−0.06* (0.03)	−0.08* (0.03)	0.14* (0.06)	−0.04 (0.03)	0.03 (0.02)	0.11* (0.03)	−0.07 (0.05)	0.05 (0.03)
Yearly change	−0.01* (0.00)	−0.02* (0.00)	−0.04* (0.00)	−0.02* (0.00)	−0.01* (0.00)	−0.01* (0.00)	0.02* (0.00)	−0.01* (0.00)
Group	−0.17* (0.03)	−0.08* (0.03)	−0.06 (0.08)	0.16* (0.04)	0.09* (0.03)	0.09* (0.03)	0.07 (0.06)	−0.13* (0.03)

Notes: Group: 0 = event, 1 = control.

\*  $p < .05$ .

declines persisted even after accounting for normative declines common to both event and control groups (0.06 points or 0.08 standard deviations for marriage, 0.08 points or 0.10 standard deviations for childbirth). Positive affect also decreased following death of spouse (0.12 points or 0.15 standard deviations). However, those who did not experience widowhood showed an even larger decline over time, suggesting that widows and widowers actually had higher levels of positive affect than they would have had if their spouse was still alive (difference of 0.14 points or 0.18 standard deviations). Although the results suggested that positive affect decreased relative to baseline in the years after an unemployment bout (difference of 0.16 points or 0.21 standard deviations), this decrease appears to reflect normative declines in positive affect that occur over time. After accounting for normative changes, long-term positive affect levels of people who experienced an unemployment bout were not different than they would have been if they did not experience unemployment.

People reported less negative affect in the years surrounding marriage (0.08 points or 0.12 standard deviations) and in the years that followed (0.06 points or 0.09 standard deviations). Analyses with control groups suggested that this trend appears to reflect normative changes as there were no significant differences in negative affect from the normative trajectories that would have been observed regardless of marriage. For childbirth, we found no significant changes in negative affect over time. However, negative affect declined over time in the group who did not experience childbirth. Thus the tendency of parents to report stable levels of negative affect suggests that childbirth may contribute to higher negative affect over time. That is, people seem to experience more negative affect after birth of their first child than they would have if they had remained childless (difference of 0.11 points or 0.17 standard deviations). We found no long-lasting changes in negative affect following widowhood and unemployment, although widows and widowers reported higher negative affect in the years surrounding death of spouse (0.16 points or 0.24 standard deviations, after accounting for normative changes in negative affect).

### 3.2.1. Personality as a moderator of change of affect

A meta-analysis by Steel, Schmidt, and Shultz (2008) suggested that neuroticism is negatively associated with both positive affect (in the negative direction) and negative affect (in the positive direction), and the remaining Big Five personality traits are positively associated with positive affect and negatively associated with negative affect. Other than the association with openness, we generally replicated these findings, as can be seen from the personality's effects on baseline estimates in Table 5.

Overall, we found no moderating effects of personality on changes in affect that were consistent with previous findings and

theories and across desirable (marriage and childbirth) and undesirable (widowhood and unemployment) life events. We did observe one association that was consistent for marriage and childbirth: openness to experience was associated with greater short-term decreases in positive affect in the year of these two life events that are generally thought to have a positive effect on people's lives. In addition, we found a positive association of neuroticism with longer-term change in positive affect following childbirth – people higher in neuroticism reported lower decline in positive affect relative to baseline. Neuroticism was also negatively associated with adaptation to widowhood, with greater decreases in positive affect for people that scored higher in neuroticism, following loss of spouse. On the other hand, extraversion seemed to serve a protective function: more extraverted widows and widowers reported larger increases in positive affect following widowhood than those who were less extraverted. However, these associations are not consistent with previous theories and laboratory research and we advise caution in interpreting these findings until they are replicated in future studies.

When we examined personality moderators of change in negative affect following life events, we found that neuroticism was consistently related with greater declines in negative affect that followed experience of positive events (i.e., marriage and childbirth), both in the year in which these events were experienced and in the years that followed. Neuroticism was also associated with greater long-term declines in well-being following unemployment. In addition, we found that more extraverted people reported larger increases in negative affect in the year of marriage. We found no consistent support for the theory that individuals high in neuroticism may be particularly vulnerable to experiences of negative events.

## 4. Discussion

Generally speaking, our results largely replicate the findings of Yap et al. (2012) regarding the main effects of life events on life satisfaction. Consistent with Yap et al., this study shows that marriage, childbirth, widowhood, and unemployment are associated with significant changes in life satisfaction in the time around the event. In the years following, these results also replicate the finding that married people remain higher in life satisfaction than those who remain unmarried – and this effect persists even after accounting for pre-existing differences between married and unmarried respondents. Those who have children or become unemployed, on the other hand, do not display lasting changes in life satisfaction after normative changes are taken into account. Indeed, these results in the HILDA, like those of Yap et al., suggest that in the long run married people are better off than if they had

**Table 5**  
Estimates of baseline affect, change from baseline in the year of event, and change from baseline in the following years, and the moderating effects of personality on these three parameters.

	Positive affect					Negative affect				
	N	E	O	A	C	N	E	O	A	C
<b>Marriage</b>										
<i>Baseline</i>										
Intercept	4.20 <sup>+</sup> (0.03)	4.20 <sup>+</sup> (0.03)	4.20 <sup>+</sup> (0.03)	4.20 <sup>+</sup> (0.03)	4.20 <sup>+</sup> (0.03)	2.36 <sup>+</sup> (0.02)	2.36 <sup>+</sup> (0.03)	2.36 <sup>+</sup> (0.03)	2.36 <sup>+</sup> (0.03)	2.36 <sup>+</sup> (0.03)
Personality	-0.21 <sup>+</sup> (0.03)	0.12 <sup>+</sup> (0.03)	-0.12 <sup>+</sup> (0.03)	0.03 (0.04)	0.14 <sup>+</sup> (0.03)	0.28 <sup>+</sup> (0.02)	-0.08 <sup>+</sup> (0.03)	0.15 <sup>+</sup> (0.03)	0.02 (0.03)	-0.11 <sup>+</sup> (0.03)
<i>Event year change</i>										
Intercept	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	-0.12 <sup>+</sup> (0.03)	-0.12 <sup>+</sup> (0.03)	-0.12 <sup>+</sup> (0.03)	-0.12 <sup>+</sup> (0.03)	-0.12 <sup>+</sup> (0.03)
Personality	0.00 (0.03)	-0.05 (0.03)	-0.06 <sup>+</sup> (0.03)	-0.01 (0.04)	-0.02 (0.03)	-0.07 <sup>+</sup> (0.03)	0.06 <sup>+</sup> (0.03)	0.04 (0.03)	0.03 (0.03)	0.05 (0.03)
<i>Post-event change</i>										
Intercept	-0.09 <sup>+</sup> (0.03)	-0.09 <sup>+</sup> (0.03)	-0.09 <sup>+</sup> (0.03)	-0.09 <sup>+</sup> (0.03)	-0.09 <sup>+</sup> (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.03 (0.03)
Personality	0.01 (0.03)	0.01 (0.03)	-0.03 (0.03)	-0.03 (0.04)	-0.01 (0.03)	-0.08 <sup>+</sup> (0.03)	0.02 (0.03)	-0.03 (0.03)	-0.01 (0.03)	0.03 (0.03)
<b>Childbirth</b>										
<i>Baseline</i>										
Intercept	4.19 <sup>+</sup> (0.03)	4.19 <sup>+</sup> (0.03)	4.19 <sup>+</sup> (0.03)	4.19 <sup>+</sup> (0.03)	4.19 <sup>+</sup> (0.03)	2.32 <sup>+</sup> (0.02)	2.32 <sup>+</sup> (0.02)	2.32 <sup>+</sup> (0.02)	2.32 <sup>+</sup> (0.02)	2.32 <sup>+</sup> (0.02)
Personality	-0.23 <sup>+</sup> (0.03)	0.13 <sup>+</sup> (0.03)	-0.02 (0.03)	0.11 <sup>+</sup> (0.03)	0.14 <sup>+</sup> (0.02)	0.24 <sup>+</sup> (0.02)	-0.10 <sup>+</sup> (0.02)	0.04 (0.02)	-0.03 (0.03)	-0.09 <sup>+</sup> (0.02)
<i>Event year change</i>										
Intercept	-0.06 <sup>+</sup> (0.03)	-0.06 <sup>+</sup> (0.03)	-0.07 <sup>+</sup> (0.03)	-0.06 <sup>+</sup> (0.03)	-0.07 <sup>+</sup> (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)
Personality	0.04 (0.03)	0.01 (0.03)	-0.06 <sup>+</sup> (0.03)	-0.05 (0.03)	0.00 (0.03)	-0.06 <sup>+</sup> (0.03)	0.00 (0.03)	0.03 (0.03)	0.01 (0.03)	-0.02 (0.02)
<i>Post-event change</i>										
Intercept	-0.19 <sup>+</sup> (0.03)	-0.19 <sup>+</sup> (0.03)	-0.19 <sup>+</sup> (0.03)	-0.19 <sup>+</sup> (0.03)	-0.19 <sup>+</sup> (0.03)	0.06 <sup>+</sup> (0.02)	0.06 <sup>+</sup> (0.02)	0.06 <sup>+</sup> (0.02)	0.06 <sup>+</sup> (0.02)	0.06 <sup>+</sup> (0.02)
Personality	0.09 <sup>+</sup> (0.03)	-0.02 (0.03)	-0.01 (0.03)	-0.04 (0.03)	-0.03 (0.03)	-0.07 <sup>+</sup> (0.02)	0.03 (0.02)	0.02 (0.02)	0.05 <sup>+</sup> (0.03)	0.00 (0.02)
<b>Widowhood</b>										
<i>Baseline</i>										
Intercept	3.99 <sup>+</sup> (0.07)	3.96 <sup>+</sup> (0.08)	3.97 <sup>+</sup> (0.08)	3.96 <sup>+</sup> (0.08)	3.99 <sup>+</sup> (0.07)	2.21 <sup>+</sup> (0.06)	2.22 <sup>+</sup> (0.06)	2.21 <sup>+</sup> (0.06)	2.22 <sup>+</sup> (0.06)	2.21 <sup>+</sup> (0.06)
Personality	-0.25 <sup>+</sup> (0.08)	0.14 (0.08)	0.13 <sup>+</sup> (0.06)	0.20 <sup>+</sup> (0.08)	0.22 <sup>+</sup> (0.07)	0.26 <sup>+</sup> (0.06)	-0.07 (0.06)	-0.04 (0.05)	-0.07 (0.07)	-0.17 <sup>+</sup> (0.06)
<i>Event year change</i>										
Intercept	-0.58 <sup>+</sup> (0.08)	-0.59 <sup>+</sup> (0.08)	-0.58 <sup>+</sup> (0.08)	-0.59 <sup>+</sup> (0.08)	-0.58 <sup>+</sup> (0.08)	0.42 <sup>+</sup> (0.06)	0.42 <sup>+</sup> (0.06)	0.42 <sup>+</sup> (0.06)	0.42 <sup>+</sup> (0.06)	0.42 <sup>+</sup> (0.06)
Personality	-0.13 (0.08)	0.13 (0.08)	0.04 (0.07)	-0.02 (0.09)	0.13 (0.08)	0.12 (0.06)	-0.11 (0.06)	-0.05 (0.05)	-0.03 (0.07)	-0.03 (0.06)
<i>Post-event change</i>										
Intercept	-0.11 (0.06)	-0.08 (0.06)	-0.12 <sup>+</sup> (0.06)	-0.09 (0.06)	-0.13 <sup>+</sup> (0.06)	0.09 (0.05)	0.11 <sup>+</sup> (0.05)	0.10 <sup>+</sup> (0.05)	0.10 <sup>+</sup> (0.05)	0.10 <sup>+</sup> (0.05)
Personality	-0.13 <sup>+</sup> (0.06)	0.19 <sup>+</sup> (0.06)	0.06 (0.05)	0.13 (0.07)	-0.04 (0.06)	0.06 (0.05)	0.03 (0.05)	0.01 (0.04)	-0.05 (0.05)	0.02 (0.05)
<b>Unemployment</b>										
<i>Baseline</i>										
Intercept	4.04 <sup>+</sup> (0.04)	4.05 <sup>+</sup> (0.04)	4.05 <sup>+</sup> (0.04)	4.05 <sup>+</sup> (0.04)	4.05 <sup>+</sup> (0.04)	2.50 <sup>+</sup> (0.04)	2.50 <sup>+</sup> (0.04)	2.50 <sup>+</sup> (0.04)	2.50 <sup>+</sup> (0.04)	2.50 <sup>+</sup> (0.04)
Personality	-0.24 <sup>+</sup> (0.04)	0.16 <sup>+</sup> (0.04)	-0.11 <sup>+</sup> (0.04)	0.10 <sup>+</sup> (0.05)	0.08 (0.04)	0.26 <sup>+</sup> (0.03)	-0.12 <sup>+</sup> (0.04)	0.09 <sup>+</sup> (0.04)	-0.03 (0.04)	-0.08 <sup>+</sup> (0.04)
<i>Event year change</i>										
Intercept	-0.07 (0.04)	-0.07 (0.04)	-0.07 (0.04)	-0.07 (0.04)	-0.07 (0.04)	-0.04 (0.04)	-0.04 (0.04)	-0.04 (0.04)	-0.04 (0.04)	-0.04 (0.04)
Personality	0.01 (0.04)	0.03 (0.04)	0.00 (0.04)	-0.07 (0.05)	-0.05 (0.04)	-0.02 (0.03)	-0.03 (0.04)	-0.06 (0.03)	-0.01 (0.04)	0.01 (0.04)
<i>Post-event change</i>										
Intercept	-0.13 <sup>+</sup> (0.04)	-0.14 <sup>+</sup> (0.04)	-0.13 <sup>+</sup> (0.04)	-0.13 <sup>+</sup> (0.04)	-0.13 <sup>+</sup> (0.04)	0.02 (0.03)	0.02 (0.03)	0.02 (0.03)	0.02 (0.03)	0.02 (0.03)
Personality	0.01 (0.03)	0.00 (0.03)	0.00 (0.03)	-0.06 (0.04)	0.01 (0.03)	-0.06 <sup>+</sup> (0.03)	0.02 (0.03)	-0.04 (0.03)	0.00 (0.04)	-0.03 (0.03)

Notes: N = Neuroticism, E = Extraversion, O = Openness to experience, A = Agreeableness, C = Conscientiousness.

<sup>+</sup>  $p < .05$ .



remained unmarried, but that childbirth and unemployment are not associated with lasting changes in life satisfaction that are unique to the experience of these events.

Regarding the moderating effects of personality, the results of this study again replicate the findings of Yap et al. (2012) and suggest that the Big Five are not consistently associated with variation in the degree to which well-being changes following major life events. It is worth noting that one of the consistent, albeit unexpected effects of personality that we do find across the HILDA and BHPS (i.e., Yap et al., 2012) is that people higher in agreeableness report more declines in life satisfaction following marriage. The fact that this somewhat counterintuitive finding was found in two extremely large, independent national samples suggests that this may be a reliable finding that is worth pursuing in future research evaluating the effects of personality on changes in well-being following major life events.

A novel contribution of the current study was that it was the first to use a large nationally representative panel study to evaluate whether the experience of various major life events has lasting effects on positive and negative affect and first to evaluate the extent to which personality traits account for variability among people's changes in affect following life events. The results of this study demonstrate that certain life events are also associated with changes in positive and negative affect, and some of these changes persist in the years that follow the experience of life events. For instance, this study suggests that both marriage and childbirth are associated with lasting declines in positive affect and that these declines persist even after accounting for normative, age-related changes in positive affect that would have occurred had these individuals remained single or childless. Further, although childbirth was not associated with changes in negative affect relative to pre-birth baseline levels, our analyses suggest that individuals' levels of negative affect are higher than they would have been if they had not had children. There was an unexpected effect of widowhood on long term positive affect, and our results suggest that those who lost a spouse reported higher positive affect than they would have had if their spouse had remained alive. This finding is clearly counterintuitive and more work needs to be done to replicate this finding and understand the potential processes involved before any firm conclusions should be made about the nature of this effect.

Another novel aspect of our study was that we were able to examine whether personality moderated within-person change in affect following experience of life events. Most existing laboratory studies that tested person-situation hypotheses about differential reactivity of individuals with different personalities to positive and negative stimuli assessed affect as an outcome variable. Thus, this study provided a more direct extension of existing studies by testing whether changes in affect that followed experience of desirable and undesirable life events were moderated by personality traits. Generally speaking, the results of this study demonstrate that the Big Five are not consistently associated with changes in well-being that occur as people experience major life events. Further, of the effects that we did find, many were not consistent with past research or the theory on the Big Five and its expected effects on affective responses to stressful life events (e.g., Larsen & Ketelaar, 1989; Larsen & Ketelaar, 1991). For instance, openness to experience was associated with greater

decreases in positive affect in the year of marriage and childbirth (both of which are generally perceived to be positive events), and people higher in neuroticism reported greater declines in negative affect both in the years surrounding and the years following marriage and childbirth – which is clearly inconsistent with past findings that show neuroticism is associated with vulnerability to negative stimuli and events.

## 5. Conclusions

Although results from large sample studies like that used in Yap et al. (2012) might be expected to be especially robust (cf. Anusic, Yap, & Lucas, in press), it is still important to test the replicability of the reported results. Our results show that although the basic trajectories of change in life satisfaction mostly replicate, few consistent patterns of moderators emerge across these studies.

## Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.jrp.2014.04.009>.

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