

A Service of



Leibniz-Informationszentrum Wirtschaft Leibniz Information Centre for Economics

Ha Trong Nguyen; Schurer, Stefanie; Mitrou, Francis

Working Paper The (in)stability of locus of control: New insights from distributional effects of major life events

GLO Discussion Paper, No. 1532

Provided in Cooperation with: Global Labor Organization (GLO)

Suggested Citation: Ha Trong Nguyen; Schurer, Stefanie; Mitrou, Francis (2024) : The (in)stability of locus of control: New insights from distributional effects of major life events, GLO Discussion Paper, No. 1532, Global Labor Organization (GLO), Essen

This Version is available at: https://hdl.handle.net/10419/307107

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



WWW.ECONSTOR.EU

The (in)stability of locus of control: New insights from distributional effects of major life events

Ha Trong Nguyen^{*,†} Stefanie Schurer[§] Francis Mitrou[‡]

Earlier empirical evidence indicates that locus on control (LoC), a non-cognitive skill reflecting an individual's belief that life's outcomes result from their own efforts, is relatively unresponsive to major life events. This study re-examines this evidence by utilizing a longer panel dataset and employing more robust econometric models. Results from an individual fixed effects model reveal that a substantial proportion of major life events exert a statistically significant influence on LoC. Additionally, individual fixed effects quantile regressions show that the effects of many life events are more pronounced for individuals at the lower end of the internal LoC distribution. The analysis also uncovers heterogeneity in the effects of life events across gender and age groups, with certain events exhibiting persistent, albeit short-term, impacts on LoC. Furthermore, we find that the effects of major life events on LoC are not only statistically significant but also economically meaningful.

Keywords: Locus of Control; Unconditional Quantile; Australia

JEL classifications: I31; J24

^{*} **Corresponding author**: The Kids Research Institute Australia | Postal: GPO Box 855, Perth WA 6872, Australia | Email: ha.nguyen@thekids.org.au.

[†] The Kids Research Institute Australia & The University of Western Australia, Australia & GLO

[‡] The Kids Research Institute Australia & The University of Western Australia, Australia

[§]University of Sydney, Australia & IZA, Bonn

Acknowledgements: We thank Deborah Cobb-Clark for insightful comments and suggestions on an earlier version of this paper. This research was partly funded by the Australian Research Council Centre of Excellence for Children and Families over the Life Course (#CE200100025). This paper uses unit record data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. The HILDA Project was initiated and is funded by the Australian Government Department of Social Services (DSS) and is managed by the Melbourne Institute of Applied Economic and Social Research (Melbourne Institute). The findings and views reported in this paper, however, are those of the authors and should not be attributed to either DSS or the Melbourne Institute.

1. Introduction

A seminal study by Cobb-Clark and Schurer (2013) found that the locus of control (LoC)—a non-cognitive skill reflecting an individual's belief that life's outcomes are due to their own efforts (Rotter 1966)—of Australians adults is relatively impervious to the impact of major life events. Subsequently, Elkins *et al.* (2017) broadly confirmed this finding, albeit with nuances and exceptions, for Australian adolescents and young adults. Elkins and Schurer (2020) demonstrated that LoC tendencies are shaped early in life, where most children exhibit external control tendencies in childhood, but once becoming young adults, most would exhibit internal control tendencies and those tendencies would remain stable until mid-age. Work from other authors using similar methodology have subsequently confirmed that locus of control tendencies are relatively stable (Hovenkamp-Hermelink *et al.* 2019) and are not affected in the long-run by life events related to financial loss associated with involuntary unemployment (Preuss and Henneke 2018) or Covid-19 policy measures (Frondel *et al.* 2023).

Yet, the findings in Cobb-Clark and Schurer (2013) and in the work that followed have been surprising, because other work has shown that smaller and bigger evens in a person's life (including educational and maltreatment experiences, retirement) can have meaningful impacts on the life trajectory of personality development (Fletcher & Schurer 2017; Schurer 2017b; Kassenboehmer *et al.* 2018; Alan *et al.* 2019; Schurer *et al.* 2019; de New *et al.* 2021; Clark & Zhu 2024). One reason for why the previous work on stability and resilience to life events may not be the final word is that the previous studies used only a very simplistic modelling approach. Neither of the studies - Cobb-Clark and Schurer (2013), Elkins *et al.* (2017), and Elkins and Schurer (2020) - accounted for the likely strong influence of individual specific, time-invariant factors that may shape both responses to survey tools, that are used to measure personality, and the risk for experiencing specific life events. Previous studies also did not explore the possibility that LoC responses to life events may depend on where the individual

ranks in the LoC distribution. LoC penalties in response to a traumatising (or lifting) life event may be stronger for individuals at the top (bottom) of the LoC scale, where individuals are more vulnerable to further losses than at the top.

Given the widely acknowledged relationship between LoC and a great variety of socioeconomic outcomes (Almlund et al. 2011; Heckman et al. 2021), and the methodological concerns from previous work, a reassessment of the stability findings presented in Cobb-Clark and Schurer (2013) and Elkins et al. (2017) is warranted. This study aims to re-examine the relationship between LoC and battery of common life events by utilizing a longer panel dataset drawn from the same source as Cobb-Clark and Schurer (2013) and Elkins and Schurer (2020) and employing robust empirical methods that can account for the mediating and moderating effects of individual-specific heterogeneity. We use five waves of data sourced from the Household, Income, and Labour Dynamics in Australia (HILDA) survey on LoC (2003, 2007, 2011, 2015, 2019) and life-events, stretching the window of analysis to 16 years of an individual's life, and (within) fixed effects (FE) estimation models to identify the causal treatment effect of the experience of a specific life event on changes in LoC. Like Cobb-Clark and Schurer (2013), we allow for a window of change of four years, the elapsed years within which HILDA collected the LoC inventory. Cobb-Clark and Schurer (2013) and Elkins et al. (2017) used the change in LoC between two adjacent periods as the dependent variable in a regression model that did not control for individual fixed effects. They then constructed a measure of shock exposure in between those two time periods. We, instead, use LoC measures contemporaneously to the life event (or lead measures in robustness checks) but purge from the model the influence of individual-specific fixed effects that may cause both a greater or smaller likelihood of over-reporting extreme values on LoC and the experience of a life event (in any given period). This approach, that has been used in similar context (Jetter & Kristoffersen 2018; Kettlewell 2019; Preuss 2021), models outcomes as deviations from an

individual's longer-term mean in LoC. Using extended longitudinal data has the advantage that it allows us to model the individual-specific endogeneity more flexibly in life events (see Wooldridge (2010)). The larger sample size brought about by extended longitudinal data has furthermore the advantage that it boosts statistical power that aids our ability to detect effects of rare life events and response heterogeneity at the extreme ends of the LoC distribution. Although the FE model comes at the disadvantage that it identifies the estimate of the impact of any specific life event only for individuals who experienced and reported the event at least once, but not all the time in each measurement period, this may be less of a problem in our long panel.¹

To gain greater insight into impact heterogeneity, we employ a fixed effects unconditional quantile regression model that was originally developed by Firpo (2007) and Firpo *et al.* (2009) and adapted to include fixed effects by Canay (2011).² This FE quantile regression model allows us to explore the distributional effects of multiple life events on LoC along the spectrum of LoC. By analysing treatment effects at various quantiles, we gain insights into the differential impact of major life events on individuals, thereby informing the development of more targeted and effective policy interventions.

Our analyses yield four noteworthy findings. First, the mean individual FE regression model reveals that 14 of the 20 considered major life events statistically significantly influence LoC at the 5% level or better. Among the five events positively associated with LoC, pregnancy exhibits the largest effect, increasing internal LoC by 0.10 standard deviations (SD).

¹ As will be discussed in more detail in Section 3.2, this individual FE model cannot fully account for all potential factors contributing to the endogeneity of various major life events, limiting the interpretation of the estimates as causal. A non-Australian study by Hovenkamp-Hermelink *et al.* (2019) employs a cross-sectional empirical model that does not control for individual fixed effects to explore the relationship between major life events and LoC. Recent studies have quantified the causal impact of specific life events, such as retirement (Clark & Zhu 2024) or weather-related home damage (Nguyen & Mitrou 2024a), on LoC by employing instrumental variable methods. However, finding sufficient plausible instruments to identify all life events in our context remains challenging, if not impossible.

² For an accessible review and interpretations of these models, see Rios-Avila and Maroto (2024).

Conversely, among the nine negatively associated events, major financial decline has the most substantial impact, reducing internal LoC by 0.28 SD. These findings are comparable in magnitude to what has been presented in Cobb-Clark and Schurer (2013) and Elkins *et al.* (2017).

Second, and importantly, individual FE quantile regression models demonstrate that the effects of many life events are more pronounced for individuals at the lower end of the internal LoC distribution. Specifically, pregnancy has the most substantial positive impact at the 10th percentile of the internal LoC distribution (0.21 SD increase), while major financial decline has the most detrimental effect (0.63 SD decrease) at the same percentile. The estimation results are robust to a series of sensitivity checks, including adjustments made for multiple hypothesis testing. The heterogeneity in the impact of life events on LoC at the extreme ends of the LoC distribution suggest that for some people in the Australian population life events can have a significant penalty on their LoC while for others, it does not. The differences in how people respond to life events are not only statistically, but economically meaningful. This is a truly novel finding that puts more nuance on the interpretations of Cobb-Clark and Schurer (2013) and the work that followed.

Third, we find evidence of significant heterogeneity in the effects of life events across gender and age groups. Fourth, certain events, including reconciliation with a spouse, pregnancy, serious personal injury or illness, retirement, and significant financial decline, exhibit persistent, albeit short-term, impacts on LoC. We conclude that the broad conclusions drawn from Cobb-Clark and Schurer (2013) and others that followed are reliable for the representative agent in the population, but that there are some individuals in the population who respond very sensitively to exposure to life events in terms of their outlook to life. It is this more vulnerable population that may be most at risk and therefore the focus of any policy intervention. Our findings demonstrate the value of extended longitudinal data when interest lies not only in the mean effect of a treatment but also in the most vulnerable groups of the population.

The remainder of this paper is structured as follows. In Section 2, we provide a short recap of the main literature. In Section 3, we present our empirical framework, including a detailed description of the data and variable construction, and an outline of the econometric models employed to examine the effects of major life events on individuals' LoC. Section 4 presents the estimation results for models that consider both the impact at the mean and across the whole distribution of LoC, while in Section 5 we demonstrate the robustness of the findings. In Section 6, we uncover the dynamic nature in the effects of life events on LoC and discuss the monetary implications of these treatment effects. Finally, Section 7 summarizes the key takeaways of our analyses and their implications.

2. A short recap of the literature

By examining the sensitivity of LoC to major life events, this study contributes to two broadly defined lines of research. The first body of literature investigates the stability, origins and age gradients of various personality traits, such as the Big Five personality traits (Cobb-Clark & Schurer 2012; Brown & Taylor 2014; Elkins *et al.* 2017; Fletcher & Schurer 2017), risk preferences (Schildberg-Hörisch 2018; Kettlewell 2019; Banks *et al.* 2020; Hetschko & Preuss 2020), interpersonal trust (Jetter & Kristoffersen 2018), mental health (Etilé *et al.* 2021), time-preferences (Preuss 2021), and self-control (Cobb-Clark *et al.* 2023). Within this literature, our study is more closely related to a small but rapidly growing number of studies exploring the stability and changes in LoC in response to various major life events. The first study in this literature is Cobb-Clark and Schurer (2013) wo used data from the Household, Income and Labour Dynamics in Australia (HILDA) survey to document that LoC scores do not change over a four-year period (between 2003 and 2007) for individuals aged 25 to 60, whereas older people beyond age 60 tend to become more external. They also found that LoC does not change

in response to the most common demographic, health, or labour market events. They found some statistically significant effects for the shock of worsening of finances (0.18 SD for men, 0.13 SD for women) and large-scale ongoing shocks such as health (0.15 SD for men, 0.2 SD for women) and employment (0.23 SD for men, 0.39 SD for women). Although these are not small changes in terms of SD, Cobb-Clark and Schurer (2013) calculated that when considering these changes in terms of hourly wage losses, they are economically not meaningful. For instance, for men the implied LoC drop in response to a worsening of finances is less than 50 cents per hour less in wages. For women, they find that an extreme employment shock (ongoing over several periods) lowers internal LoC no more than an equivalent drop of hourly wages of \$1.2, the largest observed drop in the whole sample (N=23 women).

Elkins *et al.* (2017) extended the work of Cobb-Clark and Schurer (2013) by using a more recent release of the same HILDA data to examine the stability of LoC over an eight-year period (between 2003 and 2011) for individuals aged 15 to 24. They found only small average changes in LoC for this demographic and that LoC is largely unresponsive to major life events, with one notable exception. Youth who experience ongoing health problems, such as chronic pain or long-term health conditions over three consecutive years, experience increases in external locus of control tendencies equivalent to 0.5 SD and 0.93 SD, respectively.³ The authors calculated that such changes are equivalent to an hourly wage loss of between 2.6 and 6.3% (pain) and -1.4 and 3.4% (long-term health conditions). Elkins and Schurer (2020) followed the LoC trajectories of the 1970 British birth cohort over 32 years, following the same

³ We refrain from considering the response of LoC to two "high-frequency" shocks related to changes in chronic pain and long-term health conditions, as examined by Elkins *et al.* (2017), for three primary reasons. First, these shocks are not directly addressed in the major life event questionnaire. Second, consistent with the design of the questionnaire, other studies using the same dataset to explore the responses of non-cognitive skills to major life events have also excluded these shocks (Cobb-Clark & Schurer 2013; Jetter & Kristoffersen 2018; Kettlewell 2019). Third, estimating the effects of these "high-frequency" shocks requires an arbitrary classification, unlike major life events, which are explicitly reported. For instance, Elkins *et al.* (2017) define individuals as experiencing a "high-frequency" health shock if they report health conditions, such as long-term health problems that impair daily functioning, at least three times in the previous four years. The estimates may vary in terms of statistical significance and magnitude depending on the specific definition used for these shocks.

children born in 1970 until they turned 42. They found significant changes in locus of control beliefs between childhood and middle age. Most children expressed external control beliefs at age 10, while most expressed internal control beliefs by the time they turned 30. Only a small proportion of survey respondents changed their control beliefs between ages 30 and 40. The strongest predictor for life-long positive control beliefs was parental engagement (in particular fathers') with the education of the cohort member.

Studies have also used data from other countries to examine the stability and changes in LoC. For example, Nowicki *et al.* (2018) employed data from the Avon Longitudinal Study of Parents and Children in the United Kingdom and found that LoC substantially changes over time, with the change being more pronounced for children than for their parents. Preuss and Hennecke (2018) used the German Socio-Economic Panel (SOEP) to find that job loss due to plant closure reduces internal LoC. Marsaudon (2022) also employed SOEP data to find that the length and frequency of hospital stays have only little influence on LoC. Similarly, Frondel *et al.* (2023) used another panel dataset called Socio-Ecological panel from Germany to find that LoC remained unchanged by the experience of COVID-19-related financial losses.

Hovenkamp-Hermelink *et al.* (2019) leveraged data from five waves over nine years of around 2,000 Dutch participants to find that LoC was relatively stable over nine years, with individuals becoming slightly more internal with age. They also found that negative life events were associated with the development of a more external LoC, whereas positive life events were associated with the development of a more internal LoC. More recently, two Australian studies, also using the HILDA data, showed that retirement causally increases internal LoC, albeit only in the short run (Clark & Zhu 2024), while natural disaster-related home damage decreases it (Nguyen & Mitrou 2024a).

Our work also contributes to a second line of research investigating the relationship between LoC and various life outcomes. Studies have demonstrated that individuals with an internal

LoC, who believe their outcomes are contingent on their own actions, exhibit superior results in areas such as labour market success, finances, and education. For instance, compared to those with an external LoC, individuals with an internal LoC tend to have higher wages (Cobb-Clark 2015; Xue *et al.* 2020), engage in more intensive job searches when unemployed (Caliendo *et al.* 2015), are more likely to return to work more quickly when experiencing a health shock (Schurer 2017a), migrate more often (Caliendo *et al.* 2019), invest more in education (Coleman & DeLeire 2003; Cebi 2007; Caliendo *et al.* 2022), save more money (Cobb-Clark *et al.* 2016), adopt healthier behaviours (Cobb-Clark *et al.* 2014; Kesavayuth *et al.* 2020), purchase greater insurance coverage (Antwi-Boasiako 2017; Bonsang & Costa-Font 2022), and hold more risky assets (Salamanca *et al.* 2020), and are less likely to be transport poor (Churchill & Smyth 2024).

Moreover, research within this literature suggests that individuals with a stronger internal LoC exhibit greater coping abilities when affected by negative events, such as job losses, health shocks, local crimes, or natural disasters (Buddelmeyer & Powdthavee 2016; Schurer 2017a; Etilé *et al.* 2021; Churchill & Smyth 2022; Güzel *et al.* 2024). It is important to note that, consistent with established theoretical models and earlier empirical evidence (Rotter 1966; Borghans *et al.* 2008; Heckman & Kautz 2012; Cobb-Clark & Schurer 2013), these prior studies largely treat LoC as a fixed and exogenous variable within their empirical framework.

3. Empirical framework

3.1. Household, Income, and Labour Dynamics in Australia dataset

We utilize data from the Household, Income and Labour Dynamics in Australia (HILDA) survey, a nationally representative longitudinal study of Australian households that commenced in 2001 (Summerfield *et al.* 2023). The initial wave included a sample of 19,914 panel members aged 15 years or older from 7,682 households. Subsequently, members of these households have been tracked annually, along with new household members resulting from

changes in the original household compositions and new households from the Wave 11 top-up sample. This methodology permits the application of an individual fixed effects model to rigorously assess the impact of major life events on LoC. Our analysis employs the latest release of the HILDA survey, encompassing data from 2001 to 2022.

Locus of control. The LoC measure in the HILDA survey is derived from respondents' responses to seven specific statements. These statements are: (1) "I have little control over the things that happen to me," (2) "There is really no way I can solve some of the problems I have," (3) "There is little I can do to change many of the important things in my life," (4) "I often feel helpless in dealing with the problems of life," (5) "Sometimes I feel that I'm being pushed around in life," (6) "What happens to me in the future mostly depends on me," and (7) "I can do just about anything I really set my mind to do." The first five statements (1-5) measure external control, whereas the last two (6-7) assess internal control. Respondents indicate their level of agreement or disagreement with each statement on a scale from 1 ("Strongly disagree") to 7 ("Strongly agree").

Following established Australian research utilizing the same HILDA data (Cobb-Clark & Schurer 2013; Elkins *et al.* 2017), we constructed a summary measure of LoC by summing responses to the seven items. To do so, we reverse-coded responses to the first five statements to make them consistent across all seven statements. The summary index ranges from 7 to 49, where a higher score indicates a greater sense of personal control over life outcomes or internal locus of control).⁴ To facilitate the interpretation of results, this LoC summary score is

⁴ It is noteworthy that prior Australian research (Cobb-Clark & Schurer 2013; Elkins *et al.* 2017) employed an alternative coding methodology for the LoC measure. Specifically, they reversed the coding of the final two statements and combined these with the original scores of the first five statements. Within this construct, a higher score signifies a more external LoC. Our study departs from this approach due to the potential for counterintuitive interpretations of events commonly perceived as positive, such as substantial financial gains. Such events are typically associated with an enhanced sense of control and are similarly conceptualized in preceding studies. Moreover, the alternative coding method would yield positive estimates for ostensibly negative events, including significant financial losses or the demise of a spouse or child. Although adopting the alternative coding scheme does not fundamentally change our core findings, as subsequent analyses will demonstrate, our chosen coding

standardized to have a mean of zero and a standard deviation of one.⁵ A higher score on this standardized LoC measure still indicates a greater sense of control over life. In the current release of HILDA, the LoC measure is available only in Waves 3, 4, 7, 11, 15, and 19.

Major life events. An appealing advantage of the HILDA survey is that, from Wave 2 onwards, respondents are queried about the occurrence of major life events within the same section of the self-completion questionnaire that also addresses LoC. Respondents are prompted with, "We now would like you to think about major events that have happened in your life over the past 12 months," and are then asked to indicate whether each of the listed events occurred and the time frame of their occurrence. Drawing on previous Australian and international studies examining the (in)stability of personality traits (Cobb-Clark & Schurer 2013; Elkins *et al.* 2017), we analyse the responses of LoC to twenty major life events as self-reported by the respondents.⁶ Specifically, eleven commonly experienced negative life events are considered, including "separated from spouse," "serious personal injury/illness," "serious injury/illness to a family member," "death of spouse or child," "death of a close relative/family member," "close family member detained in jail," "fired or made redundant," and "major worsening in finances." Furthermore, five typically documented positive life events are included: "got married,"

methodology enables more intuitive interpretation of the effects of both positively and negatively valanced life events.

⁵ To ensure comparability across the diverse samples employed in this study, the LoC summary score is standardized utilizing all valid LoC summary scores derived from individuals observed in Release 22 of the HILDA dataset. Within this original dataset, the raw LoC summary scores, which range from 7 to 49, have a sample mean of 32.20 and a standard deviation of 6.33. It is important to note that this standardization approach may result in standardized scores with means and SD deviating slightly from zero and one, respectively, for specific subsets of the data, including the primary sample. In contrast to our approach, that Cobb-Clark and Schurer (2013) and Elkins *et al.* (2017) employ the change in individual LoC as the dependent variable and subsequently standardize this dependent variable. While this alternative scaling method differs from our approach, it is essential to emphasize that our core findings remain unaffected by this methodological variation.

⁶ Given the low prevalence of individuals experiencing detention (fewer than 200 cases within the study period), this event is excluded from the analysis. Similarly, the event related to home damage or destruction due to weatherrelated disasters is omitted due to data limitations, as this information is exclusively available from Wave 9 of the HILDA dataset (Nguyen & Mitrou 2024b). Refer to Appendix Table A1 for descriptions of major life events and Appendix Table A2 for their correlations.

"pregnancy/pregnancy of partner," "birth/adoption of a new child," "promoted at work," and "major improvement in finances." To capture the potential for more ambiguous impacts on LoC, additional events such as "got back together with spouse," "retired from the workforce," "changed jobs," and "changed residence" are incorporated.

Estimation sample. Our baseline analysis focuses on individuals aged 15 or older. We restrict the sample to survey waves that include both LoC and life events measures. Consequently, our sample encompasses six HILDA waves: 3, 4, 7, 11, 15, and 19. Additionally, we require individuals to be observed at least twice within the study period, as our primary empirical model relies on individual fixed effects. By combining these restrictions, the final sample size consists of 70,168 individual-year observations from 18,330 unique individuals across 16 years of data, spanning from 2003 to 2019.

3.2. Estimation model

We employ the following linear regression model to estimate the impact of major life events on locus of control Y for individual i observed at time t:

$$Y_{it} = \alpha + D_{it}'\boldsymbol{\beta} + X_{it}'\boldsymbol{\gamma} + \delta_i + \varepsilon_{it}, \qquad (1)$$

where D_{it} ' is a row vector of binary variables, each indicating whether individual *i* experienced any of the twenty pre-defined major life events at time *t*. X_{it} is a set of time-variant explanatory variables. δ_i captures individual-specific time-invariant unobservable factors and ε_{it} denotes the usual idiosyncratic term. α , β and γ are vectors of parameters to be estimated. In equation (1), β is a vector of parameters of interest, which captures the effects of twenty major life events on an individual's LoC.

To control for individual-specific, time-invariant heterogeneity δ_i that may co-vary with life events captured in D_{it} , we use a fixed effects regression model that purges the individual fixed effect by taking deviations from the individual-specific sample mean (Wooldridge 2010). Our approach aligns with studies by Jetter and Kristoffersen (2018), Kettlewell (2019), and Preuss (2021), who utilized individual FE models to explore the influence of major life events on interpersonal trust, risk preference, and time preferences, respectively. As in these studies, the effects of life events on LoC in this study are identified by within-individual changes in both life events and LoC. Utilizing FE regression offers an advantage by mitigating bias in the estimated β vector compared to models that do not control for these individual time-invariant unobservable factors (Wooldridge 2010).

It is important to acknowledge that the exogeneity of life events varies. Certain events, like the death of a close friend or property crime victimization, are likely more exogenous, influenced by external factors beyond individual control (Francesca *et al.* 2014; Frijters *et al.* 2014; Mitrou *et al.* 2024).⁷ For these events, the FE model estimates for β are more likely to reflect causal impacts on LoC due to the model's ability to account for individual unobservables influencing the probability of experiencing such events.

However, some major life events, such as retirement or migration, may be more dependent on individual behaviours (Clark & Zhu 2024; Nguyen & Mitrou 2024b; Nguyen *et al.* 2024). The FE model may not fully capture the causal impact of these events on LoC due to limitations in addressing reverse causality, unobserved time-variant factors correlated with both LoC and life events, and measurement errors (Wooldridge 2010; Almlund *et al.* 2011). Consequently, the estimated $\boldsymbol{\beta}$ vector in Equation (1) may not adequately capture the causal relationship between all major life events and an individual's LoC.

⁷ Specifically, two studies using HILDA data employ the death of a close friend as an instrument in a fixed effects instrumental variable approach to explore the causal effects of mental health on employment (Frijters *et al.* 2014) and on cigarette and alcohol consumption (Mitrou *et al.* 2024). Additionally, Francesca *et al.* (2014) also use HILDA data, applying an individual fixed effects model to identify the causal impact of being a crime victim on well-being.

Our empirical approach utilizes a parsimonious selection of time-variant explanatory variables at the individual and household level within the vector X_{it} . These variables encompass individual age category indicator variables, educational attainment levels, household size, and residency status within a major city.⁸ To account for potential temporal variations in the outcome variable, we incorporate separate control variables for survey year and quarter using dummy variables. Additionally, we control for regional heterogeneity by including state/territory fixed effects. Furthermore, to capture the influence of local socio-economic environments on individual behaviours, we incorporate regional unemployment rates and the Socio-Economic Indexes for Areas (SEIFA) index, a measure of relative socio-economic disadvantage. A detailed description of these variables and their summary statistics are provided in Appendix Table A1.

We employ an Ordinary Least Squares (OLS) method to estimate the individual FE equation (1). The estimates of β from this empirical model capture the effects of major life events on the LoC at the mean. With the exception of a recent study by Nguyen and Mitrou (2024a), which exclusively explores the causal distributional impacts of weather-related home damage on LoC, all prior studies focus on the effects of major life events at the mean of LoC (Cobb-Clark & Schurer 2013; Elkins *et al.* 2017). Departing from mean regression, our study explores quantile treatment effects, facilitating an examination of how the impact of each major life event varies across different points of the LoC distribution (Rios-Avila & Maroto 2024). To estimate the quantile regression equation (1), we employ the unconditional quantile regression (UQR) method proposed by Firpo *et al.* (2009). This UQR method is preferred over the conditional quantile regression method developed by Koenker and Bassett (1978) as it allows

⁸ Age categories are identified by 5-year intervals (i.e., 15-19, 20-24, ..., 74-79, and 80 or older). We employ this more flexible functional form of age, as opposed to a quadratic functional form of continuous age, based on previous research which indicates that LoC is more stable for older individuals (Cobb-Clark & Schurer 2013; Elkins *et al.* 2017). In this baseline regression, we intentionally exclude other time-variant variables such as marital status, income, or employment status due to their high correlation with several of the twenty major life events already incorporated in the regressions.

for the recovery of the marginal impact of explanatory variables, including major life events, on the unconditional quantile of *Y* without requiring the rank-preserving condition (Firpo 2007; Firpo *et al.* 2009). Furthermore, this method can be extended to include individual fixed effects to account for selection bias without redefining the quantiles (Canay 2011). Consequently, the estimates from this individual FE UQR model can be interpreted as the effects of specific life events on the LoC of individuals at different quantiles (Rios-Avila & Maroto 2024).⁹

All twenty life events are included concurrently in the analysis. The correlation matrix presented in Appendix Table A2 indicates that intercorrelations among these events are generally low, with many correlations being statistically insignificant at the 5% level. While some correlations are statistically significant, their magnitudes remain relatively modest. Expectedly, the strongest correlation observed is 0.6 between events related to pregnancy and the birth or adoption of a child. Despite these intercorrelations, the observed correlation structure suggests that each life event offers unique explanatory power in relation to the variation in LoC, thereby justifying the inclusion of all events in the model. Our approach aligns with previous studies by Kettlewell (2019) and Preuss (2021). As a sensitivity check, we replicate the methodology of Cobb-Clark and Schurer (2013) and Elkins *et al.* (2017) by analysing the impact of each life event independently. This sensitivity analysis will demonstrate that the baseline estimates, which consider all events simultaneously, are more conservative in comparison to those derived from individual event analyses.

4. Estimation results

4.1. Who experiences life events and who changes in LoC?

⁹ We employ the Stata command xtrifreg developed by Borgen (2016) to estimate this FE UQR. This command effectively accounts for a large number of fixed effects, estimates cluster-robust standard errors, and improves computational speed.

Table 1 presents the means of key characteristics for four distinct subgroups of individuals categorized by their exposure to major life events:

- (i) 38% reported no major life event during the study period;
- (ii) 19% experienced exclusively positive events (including four events with ambiguous valence as detailed in subsection 3.1);
- (iii) 25% experienced exclusively negative events; and
- (iv) 17% experienced a combination of positive and negative events.

Contrasting the differences in sample means of key variables by major life event exposure status reveals notable significant differences among these groups. For instance, compared to individuals experiencing no major life events (column (1)), those experiencing only positive events (column (2)) tend to be younger (37 vs 48 years), more likely to be born in Australia (80% vs 77%), are more likely to have some form of post-secondary qualifications (e.g. 20% vs 13% with vocational training), and live in a major city (65% vs 62%) or regions with more advantageous socio-economic conditions (SEIFA 5.9 vs 5.6) (see Column (3)). Conversely, compared to individuals experiencing no major life events, those experiencing only negative life events are older by almost four years, are less likely to be male by 3 percentage point, are less likely to have post-secondary qualifications, are less likely to live in households with fewer family members or in a major city, and are more likely to reside in regions with lower socio-economic conditions (Column (5)). Additionally, compared to individuals experiencing both positive and negative life events are younger, more likely to be born in Australia, live in households with fewer family members, and are more likely to be born in Australia, live in households with fewer family members, and are more likely to reside in regions (Column (7)).

Table 1 further reveals a hierarchical relationship between major life event exposure and internal LoC. Individuals experiencing exclusively positive events exhibit the highest levels of

internal LoC (0.15 SD above the mean), followed by those with no major life events (0.10 SD above the mean). Those experiencing both positive and negative events and those experiencing exclusively negative events score 0.1 SD below the mean.

This apparent positive (negative) association between positive (negative) life events and internal LoC is visually corroborated in Figure 1, which depicts the distribution of LoC across four different major life event exposure groups.¹⁰ Specifically, compared to individuals with no major life events, those experiencing solely positive events are overrepresented at the higher end of the internal LoC distribution (Panel A). Conversely, individuals experiencing solely negative events, or a combination of positive and negative events are underrepresented at the higher end of the internal LoC distribution (Panels B and C, respectively).

Figure 2 presents the distribution of individual-specific change in LoC between any consecutive survey waves, disaggregated by gender (Panel A) and selected major life event exposure groups (Panels B, C, and D). Although the most common change is 0 for both men and women, there is great variety in change within the sample. Albeit a tiny group, some individuals fully reversed their LoC tendencies. Most individuals changed their LoC score within seven items on a scale that ranges between 7 and 49. This is the result that has also been reported by Cobb-Clark and Schurer (2013), which implies that the majority of individuals changed their reporting behaviour at maximum 1 unit on each of the seven underlying questions (response options which range between 1 and 7). However, Figure 2 shows that there is enough within-individual variation in LoC, providing empirical support for the application of an individual FE model. Consistent with this observation, Appendix Table A1 (final column) demonstrates considerable within-individual changes in LoC in the magnitude of 0.66 SD and

¹⁰ Figure 1 displays the distribution of LoC for various subgroups, demonstrating substantial variations in this outcome. These variations facilitate an examination of the differential impacts of major life events on individuals at different points of the LoC distribution. For illustrative purposes, Figures 1 and 2 utilize raw summary scores of LoC.

other time-varying variables, further substantiating the utility of the individual FE estimation approach.

Panels B, C, and D of Figure 2 illustrate changes in internal LoC for four distinct subgroups of individuals who experienced no major life events at time t=0, subsequently categorized by their exposure to life events at time t=1.¹¹ These panels suggest a positive (negative) relationship between a transition from no major life events to exclusively positive (negative) life events and changes in internal LoC. Specifically, compared to individuals experiencing no major life events in both periods, those transitioning from no events at t=0 to solely positive events at t=1 exhibit a rightward shift in the distribution of LoC changes, indicative of an increase in internal LoC (Panel B). Conversely, individuals transitioning from no events at t=0 to exclusively negative events at t=1 display a leftward shift in the distribution of LoC changes, suggesting a decline in internal LoC (Panel C). However, no clear pattern emerges for individuals transitioning from no events at t=1 (Panel D).

4.2. What is the impact of life events on LoC?

Table 2 presents estimates of twenty major life event variables derived from estimating Equation (1) allowing for individual fixed effects. Column (1) reports the results for a regression model at the mean, while columns (2)-(10) report the estimates for each of the nine deciles. A positive coefficient implies a larger value in internal sense of control. The regression results at the mean reveal a statistically significant (5% level) effect for 14 out of 20 life events considered. There is a statistically significant and positive impact of five major life events on internal LoC: pregnancy, major improvement in finances, getting married, changing jobs, and being promoted at work. This statistically significant positive correlation suggests that

¹¹ For brevity, this analysis focuses on individuals with no major life events at t=0. Results for other initial life event exposure groups are available upon request.

individuals who experienced these events display a greater sense of control over their lives. Among these events that improve internal LoC, the largest effect is observed for pregnancy, which increases internal LoC by 0.10 standard deviations (SD), while the smallest effect is observed for being promoted at work, which increases internal LoC by 0.03 SD.

By contrast, there is a statistically significant negative impact for nine other major life events, which implies that these life events make individuals feel that they are not in control for the important components of their life. The most relevant events in terms of magnitude are (listed in descending order of the magnitude of the estimated treatment effect): major worsening in finances (-0.28 SD), being a victim of physical violence (-0.18 SD), death of a spouse or child (-0.17 SD), separation from a spouse (-0.16 SD), serious personal injury or illness (-0.09 SD), being fired or made redundant (-0.06 SD). There are other events that are also significantly linked to a reduction in internal LoC, but the magnitude of the treatment effect is less than 0.05 SD (e.g. being a victim of a property crime, serious injury or illness to a family member, and the death of a close relative or family member).

It is noteworthy that while the precise magnitude of change in self-reported financial situation is ambiguous within the data, the absolute value of the estimate for a major deterioration in financial circumstances is 4.7 times that of a major improvement (=-0.28 SD/0.06 SD=4.67). This finding of a considerably larger impact associated with negative financial events on internal LoC aligns with the theoretical framework and empirical evidence on loss aversion in behavioural economics, which posits that individuals exhibit a stronger preference for avoiding losses relative to acquiring equivalent gains (Tversky & Kahneman 1991; Baumeister *et al.* 2001).

So far, the estimates are well aligned with the estimates presented in Cobb-Clark and Schurer (2013) and Elkins *et al.* (2017). Where our results substantially differ and provide a different picture is when considering the treatment effect of life events, in particular the negative ones,

at the extreme ends of the locus of control distribution. This can be seen both in Table 2 and for ease of illustration in Figure 3. The results indicate that the impact of many events is notably more pronounced for individuals situated at the lower end of the internal LoC spectrum, as evidenced by larger (in absolute terms) and more statistically significant estimates. In some notable cases, the treatment effect is more than two times larger at the 10th percentile of LoC than at the mean. For example, the most substantial effect of the positively valanced event, pregnancy, is observed among individuals at the 10th percentile of the internal LoC distribution, where it increases LoC by 0.21 SD. This estimate is 2.1 times the mean effect of 0.10 SD. Similarly, the most detrimental effect of the negatively valanced event, major worsening in finances, is observed at the 10th percentile, where it decreases LoC by 0.63 SD, 2.3 times the mean estimate of -0.28 SD and more than ten times the estimate of the same event for individuals at the 90th percentile, which is just -0.06 SD. This estimate is also the largest in absolute terms among all estimates of all considered major life events and quantiles.

Figure 3 further demonstrates a consistent pattern of heightened impact for individuals at the lower end of the internal LoC distribution across most events that are statistically significant at the mean. Conversely, events that exhibit no significant association with LoC at the mean, including got back together with spouse, death of a close friend, close family member detained in jail, retired from the workforce, and changed residence, generally show no significant effects across the LoC distribution.

To the best of our knowledge, beyond a recent study by Nguyen and Mitrou (2024a) identifying a more pronounced negative impact of weather-related home damage for individuals with lower internal LoC, limited evidence exists regarding the differential effects of major life events across the LoC spectrum. This finding, when considered alongside the well-documented benefits of having a higher internal LoC, carries significant policy implications. It highlights the need for targeted interventions to support individuals with lower levels of perceived control when they encounter negative life events.

5. Robustness checks

This section examines the robustness of our findings through a series of specification and sampling tests. Given the scope of this analysis, the focus is on the mean regression results. An initial specification test is conducted to address the multiple hypothesis testing problem inherent in employing numerous life events as explanatory variables. To this end, the methodology proposed by Simes (1986) and Benjamini and Hochberg (1995) is applied to calculate adjusted p-values. As detailed in column (2) of Appendix Table A3, the results demonstrate that accounting for multiple hypotheses does not substantially alter the primary findings, as adjusted p-values closely align with the unadjusted p-values obtained from the baseline model (reproduced in column (1) of Appendix Table A3, with statistical significance levels denoted by asterisks).

Secondly, we replicate the approach of previous Australian studies (Cobb-Clark & Schurer 2013; Elkins *et al.* 2017) by examining the impact of each major life event individually. The results from this analysis suggest that the effects of life events on LoC are more pronounced than initially observed, both in terms of statistical significance and magnitude. Notably, all previously statistically significant life events retain their significance, often to a greater degree, and exhibit larger absolute effect sizes. For instance, the most substantial relative difference between the separate and simultaneous estimates is found for being a victim of property crime, which now decreases internal LoC by 0.06 SD, representing a 150% increase compared to the baseline simultaneous estimate of -0.04 SD. Moreover, several events previously deemed statistically insignificant, including reconciliation with a spouse, birth/adoption of a new child, death of a close friend, or incarceration of a close family member, now achieve statistical significance at the 10% level or better.

Thirdly, we estimate Equation (1) without controlling for individual fixed effects. In this pooled OLS regression, we additionally control for certain time-invariant variables such as gender and migration status. The results from this modified model, reported in column (4), demonstrate substantially more pronounced effects of major life events on the LoC than those observed from the FE regressions, both in terms of statistical significance and magnitude. Specifically, for negative events, the pooled model produces more negative and statistically significant estimates than the FE model does. Conversely, the pooled model yields more positive and statistically significant estimates for selected major life events.

The differences between the pooled and FE estimates are statistically significant at the 5% level for selected life events such as major worsening in finances, victim of physical violence, separation from a spouse, serious personal injury or illness, being fired or made redundant, and being promoted at work, as demonstrated by non-overlapping 95% confidence intervals for these major life events (see Appendix Figure A1). Furthermore, the estimates of selected major life events are statistically significant (at the 5% level) only in the pooled model. These events include reconciliation with a spouse, a close family member being detained in jail, the death of a close friend, and the birth or adoption of a new child. The substantial discrepancies between the pooled OLS and FE model estimates, as corroborated by a highly significant F-test (p <0.0001) rejecting the null hypothesis of no individual-specific time-invariant effects, strongly support the use of an individual FE model to investigate the association between life events and LoC (Wooldridge 2010).

Fourth, following Cobb-Clark and Schurer (2013), we restrict our sample to individuals aged 25 or older and apply the individual FE model (1) to this subset. The results from this analysis, presented in column (5) of Appendix Table A3, closely resemble those from the baseline analysis in Column 1, both in magnitude and statistical significance. This stability in our estimates suggests that the differences between our findings and those of Cobb-Clark and

Schurer (2013) are not due to the inclusion of individuals under 25 years old in our main sample.

Conversely, in the fifth robustness check, we apply the baseline individual FE regression model to a sample of younger individuals aged 15-24, as examined in another Australian study by Elkins et al. (2017). The estimates for this younger population, reported in column (6) of Appendix Table A3, differ markedly from those for the whole population in column (1). Specifically, the estimates for the younger subgroup are generally less statistically significant. For instance, only three events-pregnancy, victim of physical violence, and major worsening in finances—retain their statistical significance at p < 0.05. Additionally, estimates for events such as birth/adoption of a new child, death of a spouse or child, and death of a close relative/family member become marginally significant at the 10% level. By contrast, the estimate for getting back together with a spouse gains statistical significance at the 1% level, indicating a substantial decrease in internal LoC by 0.37 SD for younger individuals in this situation. For events with estimates that remain statistically significant (at least at the 5% level), the direction and magnitude generally align with population estimates, except for the estimate for pregnancy, which is positive for both groups but 2.3 times greater for the younger subgroup. The differences in statistical significance and magnitude between the younger subgroup and the overall population suggest that individuals at different life stages experience and respond to life events differently (Nowicki et al. 2018).

The lack of statistical significance for the younger population can be partly attributed to the much smaller sample size for this demographic, which is seven times smaller than that in the baseline analysis. Notably, this sample size is still about ten times larger than that used in Elkins *et al.* (2017). The larger sample size in our study improves statistical power, as demonstrated by the fact that Elkins *et al.* (2017) found statistically significant estimates at the 10% and 5%

levels, respectively, for only two life events: victim of physical violence and major worsening in finances.

Sixth, we adopt a similar modelling approach to that used in prior Australian studies (Cobb-Clark & Schurer 2013; Elkins et al. 2017), employing the change in internal LoC between two adjacent periods as the dependent variable in a regression model that does not control for individual fixed effects. Specifically, Cobb-Clark and Schurer (2013) utilize the withinindividual difference in LoC between 2003 (Wave 3) and 2007 (Wave 7) as the dependent variable in their regression analysis. To ensure comparability, we restrict our sample to survey waves with LoC information and consider only pairs of adjacent waves that are four years apart. Consequently, we use a pooled sample of data from Waves 3, 7, 11, 15, and 19. In this experiment, we employ the same explanatory variables as Cobb-Clark and Schurer (2013), including categorical age groups, gender, marital status, migration status, employment status, educational qualifications, and household income (in natural logarithm).^{12,13} These explanatory variables are measured four years prior to the year in which the dependent variable is measured. Additionally, we control for a set of life events, each taking the value 1 if an individual reports experiencing the specific life event at any point in the last three years (including the current year) before the current year, and 0 otherwise. Consistent with the previous Australian studies (Cobb-Clark & Schurer 2013; Elkins et al. 2017), we standardize the change in LoC and include each life event separately in this experiment.

¹² As noted earlier, we did not include certain time-variant variables such as marital status, employment status, and household income in our baseline individual fixed-effects (FE) regression due to their high correlation with major life events. However, in an unreported sensitivity test, we found that our FE results remain robust to the inclusion of these variables in the regressions. Similarly, in another unreported robustness test, we found that our results are largely unchanged when excluding other time-variant variables such as household size and urban residency from the regressions.

¹³ Elkins *et al.* (2017) focus on a younger population (aged 15-24) and incorporate parental educational and occupational background as controls. Given the focus on an older sample and the limited availability of parental information, these additional controls are not included in the current analysis.

It is important to note that, due to differences in the scaling of the dependent variables and samples, the estimates obtained from this experiment may not be directly comparable to our baseline estimates, which are based on the standardized internal LoC summary score. Therefore, we primarily focus on the direction and statistical significance of the estimates in this exercise.

The results of this analysis, presented in column (7) of Appendix Table A3, indicate that the majority of life events previously found to be statistically significant in the individual FE regressions with separate event inclusion (column (3)) retain their significance at the 5% level. However, five previously significant events, including pregnancy, birth/adoption of a new child, death of a spouse or child, death of a close relative/family member, and job loss, become insignificant. Conversely, two previously insignificant events, retirement and residential change, attain statistical significance at the 5% level or higher. Consequently, fourteen of the twenty events examined remain statistically significant within this specification.

It is noteworthy that this level of consistency in the significance of life event estimates is achieved despite a substantial reduction in sample size compared to the baseline regressions, which yielded seventeen significant events (85% of the total). The sample size for this analysis is reduced by over 50% due to model specifications and data transformations. These findings underscore the robustness of our results and highlight the advantages of employing larger sample sizes to enhance statistical power.

To further elucidate the impact of sample size on the estimation results, a replication of Cobb-Clark and Schurer's (2013) analysis using data from Waves 3 and 7 is conducted. Consistent with their findings, LoC is shown to be relatively insensitive to most major life events, with only four events (reconciliation with a spouse, serious injury/illness to a family member, victim of physical violence, and major worsening in finances) achieving significance at the 5% level or higher (see column (8) in Appendix Table A3). An extension of this analysis to examine gender differences in the relationship between life events and LoC, following Cobb-Clark and Schurer (2013), reveals predominantly insignificant results for both females and males (columns (9) and (10)).¹⁴ This suggests that the lack of significant findings in their study may be attributed to the substantially smaller sample size, which is approximately one-fifth the size of the current sample.

Collectively, the robustness checks underscore the heightened sensitivity of LoC to major life events relative to previous findings in the literature. The replication of the methodology employed in prior Australian studies further strengthens this conclusion, as the observed pattern of results is consistent with the current study's findings. Moreover, the lack of statistical significance in previous research is likely attributable to sample size limitations. These combined results reinforce the notion that LoC is significantly influenced by major life events.

6. Heterogeneity and dynamics in the impact of life events on LoC

6.1. Heterogeneity by gender and age

Motivated by previous studies (Cobb-Clark & Schurer 2013; Elkins *et al.* 2017; Nowicki *et al.* 2018), this section examines potential differences in the effects of life events on LoC by gender and age. We run the individual FE model (1) separately by gender (females versus males) and age (younger versus older individuals, with the younger group including individuals aged 45 years or younger, the median age in the sample). For brevity, this section focuses on heterogeneous impacts at the mean.

Figure 4 (Panel A) demonstrates that gender differences in the impact of life events on LoC are present for some but not all life events. Females, who have a lower internal LoC on average

¹⁴ Unfortunately, the precise coding methodology employed by Cobb-Clark and Schurer (2013) is unavailable, preventing an exact replication of their results. The sample utilized in this study, which adheres to their modelling approach and incorporates data from Waves 3 and 7, is slightly smaller than their combined sample of 3,859 males and 4,437 females. A potential explanation for this discrepancy lies in the differing approaches to life event inclusion. The current analysis necessitates the simultaneous inclusion of all life events, resulting in a sample restricted to individuals with complete data for all variables. In contrast, Cobb-Clark and Schurer's (2013) analysis, which examines each event individually, may have imposed less stringent sample selection criteria.

than males (mean for females is -0.001 compared to 0.043 for males, as shown in Appendix Table A4), are more negatively affected by events such as reconciling with a spouse, being fired or made redundant, and being a victim of property crime, with negative and statistically significant estimates (at least at the 10% level) exclusively for them. Conversely, males are more positively affected by major financial improvements. While the estimate is positive for both genders, it is more than three times greater in magnitude for males and statistically significant at the 1% level only for them. However, these gender differences are not statistically significant, as indicated by overlapping 95% confidence intervals. Moreover, there are no notable gender differences in the estimates of other life events, as the subgroup estimates generally align with the population estimates in terms of direction and statistical significance and are largely consistent for both females and males.

Figure 4 (Panel B) also reports subgroup estimates by age, suggesting differences in the effects of selected life events on the LoC of younger and older groups. Younger individuals, who have higher internal LoC on average than older individuals (mean for younger individuals is 0.026 SD compared to 0.013 SD for older individuals, as shown in Appendix Table A4), are more significantly affected by certain events because the estimates for these events are greater in absolute terms and more statistically significant for them. These events include being a victim of physical violence, being fired or made redundant, reconciling with a spouse, the death of a close relative or family member, the death of a close friend, major financial improvement, promotion at work, and marriage. In contrast, older individuals are more negatively affected by being a victim of property crime, with a negative and statistically significant estimate (at the 1% level) exclusively for them. However, these age-based differences are not statistically significant as confidence intervals are overlapping. Furthermore, the estimates of other life events elicit consistent responses across age groups, largely aligning with the overall population estimates.

6.2. Dynamic effects of major life events on locus of control

We next explore the dynamic effects of life events on LoC by incorporating a set of two-year lagged life events as additional explanatory variables in the baseline individual FE regression equation (1) of current LoC. Additionally, we include a set of lead life events (i.e., events occurring one year in the future) to determine whether individuals anticipate these life events. For brevity and to ensure robustness of the results given the substantial reduction in sample size due to the inclusion of lagged and lead life events, this section focuses on the regression at the mean.

The results, presented in Figure 5, highlight three key findings. First, the estimates for current life events largely mirror the baseline results, reinforcing the consistency of our findings. This consistency is encouraging despite the nearly halved sample size. Second, there is evidence of delayed effects of exposure to selected life events, as the estimates of lagged exposures to these events are statistically significant at the 5% level or higher. For instance, the statistically significant and negative estimates of one-year lagged exposure to events such as reconciling with spouse, pregnancy, serious personal injury/illness, retirement, and major financial decline indicate that individuals experiencing these events display a lower level of internal LoC in the following year. Moreover, the statistically significant (at the 1% level) and negative estimate of two-year lagged exposure to major financial decline indicates that this event continues to reduce the individual's current internal LoC beyond one year. Unexpectedly, the estimate of the two-year lagged event capturing the death of a close relative or family member is positive and statistically significant at the 5% level, suggesting that individuals experiencing this event two years ago display an improvement, albeit small at 0.04 SD, in current internal LoC.

Third, the coefficients associated with variables capturing future exposure to the twenty major life events are uniformly statistically insignificant at the 5% level, providing limited evidence of anticipatory effects on current LoC. A notable exception is observed for the variable capturing future separation from a spouse, which exhibits a negative and statistically significant (at the 5% level) relationship with current LoC, suggesting a decline in perceived control prior to the event. However, the magnitude of this anticipatory effect is less pronounced in terms of both statistical significance and absolute size compared to the contemporaneous impact of actual separation.

The overall lack of significant associations between future life events and current LoC, when controlling for lagged and contemporaneous events and individual-specific time-invariant unobservable factors, suggests that these events are largely unexpected by individuals within the sample. This finding mitigates concerns regarding reverse causality in the estimated effects of contemporaneous life events, thereby enhancing the plausibility of a causal interpretation.

6.3. Are the estimates economically meaningful?

Finally, to provide a monetary perspective on the comparative analysis, we loosely follow the approach of previous Australian studies (Cobb-Clark & Schurer 2013; Elkins *et al.* 2017). But instead of relying on estimates sourced from other studies, we estimate the LoC improvement due to a change in household income, and use this estimate to calculate the implied monetary loss or gain in LoC due to the experience of a specific life event.

The results of this analysis (Appendix Table A5), indicate a positive and statistically significant (at the 1% level) relationship between household income and internal LoC. Specifically, the estimate suggests that a one percent increase in household income is associated with a 0.03 SD increase in an individual's internal LoC.

By comparing the magnitudes of the estimates of other major life events (also reported in Appendix Table A5) and household income, we find that the effects of major life events on LoC are economically meaningful. For example, the largest estimate among positive events is associated with pregnancy, which correlates with a 0.09 SD increase in internal LoC. This

change in LoC is equivalent to a 3% increase in household income. Conversely, the largest negative effect is observed with major worsening in finances, which corresponds to a 0.29 SD decrease in internal LoC, roughly comparable to a 10% decrease in household income.

It is important to note that the above comparisons are based on potentially non-causal estimates of household income and life events. While acknowledging that our estimates may not be directly comparable to those in the literature due to differences in measures of LoC, life events, and empirical models, we aim to provide an additional perspective on the magnitude of our estimates by comparing them with causal estimates from similar studies. For instance, Preuss and Hennecke (2018), in their German study, found that job loss due to a plant closure reduces internal LoC by 0.3 SD. This is comparable to our highest diminishing effect among negative events, observed for major worsening in finances, which reduces internal LoC by 0.29 SD.

Furthermore, Nguyen and Mitrou (2024a) found that Australians at the 10th percentile of the internal LoC spectrum were most negatively affected by weather-related home damage, which reduces their LoC by 0.23 SD. Our results from the quantile FE regressions also show that individuals at the lowest end of the internal LoC distribution were most negatively affected by several negative events. Notably, four events—major worsening in finances, being a victim of physical violence, separation from a spouse, and the death of a spouse or child—reduce the LoC of individuals at the 10th percentile of the internal LoC distribution by more than 0.23 SD. Overall, our above analyses indicate that the effects of major life events on LoC are both statistically significant and economically meaningful.

7. Conclusion

This study re-examines the responsiveness of LoC to various major life events, revealing a more pronounced sensitivity than previously documented. The heightened responsiveness of LoC to life events is primarily attributed to the larger panel dataset and more robust empirical models employed in this study. By employing individual fixed effects quantile regression, the

study identifies differential effects across the LoC distribution, with more pronounced impacts for individuals at the lower end. Furthermore, evidence of heterogeneity in event effects across gender and age groups is uncovered, with certain events exhibiting persistent, albeit short-term, influences. The study demonstrates that the effects of major life events on LoC are not only statistically significant but also economically meaningful.

These findings have significant methodological and policy implications. Methodologically, the substantial instability of LoC necessitates a reconsideration of its treatment as a fixed or exogenous variable in future research. Moreover, the study's utilization of recent data and advanced empirical methods, including individual fixed effects quantile regression, provides a foundation for future investigations into the stability of other personality traits. From a policy perspective, the findings underscore the need for targeted interventions to support individuals, particularly those with lower perceived control, when confronting adverse life events.

Despite these contributions, limitations remain. While the individual fixed effects model represents an improvement over previous approaches, causal inference is still subject to challenges. Additionally, the relatively small sample sizes for subgroup analyses preclude definitive conclusions about heterogeneity. Future research should address these limitations by employing larger datasets and advanced causal inference techniques.

References

Alan, S., Boneva, T., Ertac, S., 2019. Ever failed, try again, succeed better: Results from a randomized educational intervention on grit. The Quarterly Journal of Economics 134, 1121-1162

Almlund, M., Duckworth, A.L., Heckman, J., Kautz, T., 2011. Chapter 1 - Personality Psychology and Economics. In: Hanushek EA, Machin S & Woessmann L (eds.) Handbook of the Economics of Education. Elsevier, pp. 1-181.

Antwi-Boasiako, B.A., 2017. It's beyond my control: The effect of locus of control orientation on disaster insurance adoption. International Journal of Disaster Risk Reduction 22, 297-303

Banks, J., Bassoli, E., Mammi, I., 2020. Changing attitudes to risk at older ages: The role of health and other life events. Journal of Economic Psychology 79, 102208

Baumeister, R.F., Bratslavsky, E., Finkenauer, C., Vohs, K.D., 2001. Bad is stronger than good. Review of general psychology 5, 323-370

Benjamini, Y., Hochberg, Y., 1995. Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing. Journal of the Royal Statistical Society. Series B (Methodological) 57, 289-300

Bonsang, E., Costa-Font, J., 2022. Buying control? 'Locus of control' and the uptake of supplementary health insurance. Journal of Economic Behavior & Organization 204, 476-489

Borgen, N.T., 2016. Fixed effects in unconditional quantile regression. Stata Journal 16, 403-415

Borghans, L., Duckworth, A.L., Heckman, J.J., Weel, B.t., 2008. The Economics and Psychology of Personality Traits. Journal of Human Resources 43, 972

Brown, S., Taylor, K., 2014. Household finances and the 'Big Five' personality traits. Journal of Economic Psychology 45, 197-212

Buddelmeyer, H., Powdthavee, N., 2016. Can having internal locus of control insure against negative shocks? Psychological evidence from panel data. Journal of Economic Behavior & Organization 122, 88-109

Caliendo, M., Cobb-Clark, D.A., Hennecke, J., Uhlendorff, A., 2019. Locus of control and internal migration. Regional Science and Urban Economics 79, 103468

Caliendo, M., Cobb-Clark, D.A., Obst, C., Seitz, H., Uhlendorff, A., 2022. Locus of Control and Investment in Training. Journal of Human Resources 57, 1311

Caliendo, M., Cobb-Clark, D.A., Uhlendorff, A., 2015. Locus of Control and Job Search Strategies. Review of Economics and Statistics 97, 88-103

Canay, I.A., 2011. A simple approach to quantile regression for panel data. The Econometrics Journal 14, 368-386

Cebi, M., 2007. Locus of Control and Human Capital Investment Revisited. Journal of Human Resources 42, 919-932

Churchill, S.A., Smyth, R., 2022. Locus of control and the mental health effects of local area crime. Social Science & Medicine 301, 114910

Churchill, S.A., Smyth, R., 2024. Locus of Control, Social Capital and Transport Poverty. Economic Record forthcoming

Clark, A.E., Zhu, R., 2024. Taking Back Control? Quasi-Experimental Evidence on the Impact of Retirement on Locus of Control. The Economic Journal 134, 1465–1493

Cobb-Clark, D.A., 2015. Locus of control and the labor market. IZA Journal of Labor Economics 4, 3

Cobb-Clark, D.A., Kassenboehmer, S.C., Schurer, S., 2014. Healthy habits: The connection between diet, exercise, and locus of control. Journal of Economic Behavior & Organization 98, 1-28

Cobb-Clark, D.A., Kassenboehmer, S.C., Sinning, M.G., 2016. Locus of control and savings. Journal of Banking & Finance 73, 113-130

Cobb-Clark, D.A., Kong, N., Schildberg-Hörisch, H., 2023. The stability of self-control in a population-representative study. Journal of Economic Psychology 95, 102599

Cobb-Clark, D.A., Schurer, S., 2012. The stability of big-five personality traits. Economics Letters 115, 11-15

Cobb-Clark, D.A., Schurer, S., 2013. Two Economists' Musings on the Stability of Locus of Control. The Economic Journal 123, F358-F400

Coleman, M., DeLeire, T., 2003. An Economic Model of Locus of Control and the Human Capital Investment Decision. The Journal of Human Resources 38, 701-721

de New, S.C., Schurer, S., Sulzmaier, D., 2021. Gender differences in the lifecycle benefits of compulsory schooling policies. European Economic Review 140, 103910

Elkins, R., Schurer, S., 2020. Exploring the role of parental engagement in non-cognitive skill development over the lifecourse. Journal of Population Economics 33, 957-1004

Elkins, R.K., Kassenboehmer, S.C., Schurer, S., 2017. The stability of personality traits in adolescence and young adulthood. Journal of Economic Psychology 60, 37-52

Etilé, F., Frijters, P., Johnston, D.W., Shields, M.A., 2021. Measuring resilience to major life events. Journal of Economic Behavior & Organization 191, 598-619

Firpo, S., 2007. Efficient Semiparametric Estimation of Quantile Treatment Effects. Econometrica 75, 259-276

Firpo, S., Fortin, N.M., Lemieux, T., 2009. Unconditional Quantile Regressions. Econometrica 77, 953-973

Fletcher, J.M., Schurer, S., 2017. Origins of adulthood personality: The role of adverse childhood experiences. The BE Journal of Economic Analysis & Policy 17, 20150212

Francesca, C., Naomi, E.F., Andrew, L., 2014. Crime and Mental Well-Being. Journal of Human Resources 49, 110-140

Frijters, P., Johnston, D.W., Shields, M.A., 2014. The effect of mental health on employment: Evidence from Australian panel data. Health Economics 23, 1058-1071

Frondel, M., Osberghaus, D., Sommer, S., 2023. The stability of personal traits and preferences in times of the Corona pandemic: Evidence from Germany. Social Science Quarterly 104, 1138-1153

Güzel, A., Samancı Tekin, Ç., Uçan Yamaç, S., 2024. Exploring the impacts of perceived locus of control on post-traumatic stress disorder among disaster survivors: A systematic review. Journal of Psychiatric and Mental Health Nursing forthcoming

Heckman, J.J., Jagelka, T., Kautz, T., 2021. Some contributions of economics to the study of personality. In: John OP & Robins RW (eds.) Handbook of personality: Theory and research, 4th ed. The Guilford Press, New York, NY, US, pp. 853-892.

Heckman, J.J., Kautz, T., 2012. Hard evidence on soft skills. Labour Economics 19, 451-464

Hetschko, C., Preuss, M., 2020. Income in jeopardy: How losing employment affects the willingness to take risks. Journal of Economic Psychology 79, 102175

Hovenkamp-Hermelink, J.H.M., Jeronimus, B.F., van der Veen, D.C., Spinhoven, P., Penninx, B.W.J.H., Schoevers, R.A., *et al.*, 2019. Differential associations of locus of control with anxiety, depression and life-events: A five-wave, nine-year study to test stability and change. Journal of Affective Disorders 253, 26-34

Jetter, M., Kristoffersen, I., 2018. Financial shocks and the erosion of interpersonal trust: Evidence from longitudinal data. Journal of Economic Psychology 67, 162-176

Kassenboehmer, S.C., Leung, F., Schurer, S., 2018. University education and non-cognitive skill development. Oxford Economic Papers 70, 538-562

Kesavayuth, D., Poyago-Theotoky, J., Tran, D.B., Zikos, V., 2020. Locus of control, health and healthcare utilization. Economic Modelling 86, 227-238

Kettlewell, N., 2019. Risk preference dynamics around life events. Journal of Economic Behavior & Organization 162, 66-84

Koenker, R., Bassett, G., 1978. Regression Quantiles. Econometrica 46, 33-50

Marsaudon, A., 2022. Do Hospital Stays Modify Locus of Control? De Economist 170, 257-277

Mitrou, F., Nguyen, H.T., Le, H.T., Zubrick, S.R., 2024. The causal impact of mental health on tobacco and alcohol consumption: an instrumental variables approach. Empirical Economics 66, 1287-1310

Nguyen, H.T., Mitrou, F., 2024a. Natural disasters, home damage, and the eroding locus of control. GLO Discussion Paper, No. 1448, Global Labor Organization (GLO), Essen

Nguyen, H.T., Mitrou, F., 2024b. Residential responses to cyclones: New evidence from Australia. GLO Discussion Paper, No. 1426, Global Labor Organization (GLO), Essen

Nguyen, H.T., Mitrou, F., Zubrick, S., 2024. Retirement, housing mobility, downsizing and neighbourhood quality - A causal investigation. Journal of Housing Economics 63, 101977

Nowicki, S., Iles-Caven, Y., Gregory, S., Ellis, G., Golding, J., 2018. Stability of, and Associations Between, Parent and Child Locus of Control Expectancies. Frontiers in Psychology 9

Preuss, M., 2021. Intra-individual stability of two survey measures on forward-looking attitude. Journal of Economic Behavior & Organization 190, 201-227

Preuss, M., Hennecke, J., 2018. Biased by success and failure: How unemployment shapes locus of control. Labour Economics 53, 63-74

Rios-Avila, F., Maroto, M.L., 2024. Moving Beyond Linear Regression: Implementing and Interpreting Quantile Regression Models With Fixed Effects. Sociological Methods & Research 53, 639-682

Rotter, J.B., 1966. Generalized expectancies for internal versus external control of reinforcement. Psychological Monographs: General and Applied 80, 1-28

Salamanca, N., de Grip, A., Fouarge, D., Montizaan, R., 2020. Locus of control and investment in risky assets. Journal of Economic Behavior & Organization 177, 548-568

Schildberg-Hörisch, H., 2018. Are Risk Preferences Stable? Journal of Economic Perspectives 32, 135-54

Schurer, S., 2017a. Bouncing back from health shocks: Locus of control and labor supply. Journal of Economic Behavior & Organization 133, 1-20

Schurer, S., 2017b. Does education strengthen the life skills of adolescents? IZA World of Labor, 366

Schurer, S., Trajkovski, K., Hariharan, T., 2019. Understanding the mechanisms through which adverse childhood experiences affect lifetime economic outcomes. Labour Economics 61, 101743

Simes, R.J., 1986. An improved Bonferroni procedure for multiple tests of significance. Biometrika 73, 751-754

Summerfield, M., Garrard, B., Kamath, R., Macalalad, N., Nesa, M.K., Watson, N., *et al.*, 2023. HILDA User Manual – Release 22. Melbourne Institute of Applied Economic and Social Research, The University of Melbourne

Tversky, A., Kahneman, D., 1991. Loss aversion in riskless choice: A reference-dependent model. The quarterly journal of economics 106, 1039-1061

Wooldridge, J.M., 2010. Econometric Analysis of Cross Section and Panel Data. MIT Press, Cambridge, Mass.

Xue, S., Kidd, M.P., Le, A.T., Kirk, K., Martin, N.G., 2020. The role of locus of control in adulthood outcomes: Evidence from Australian twins. Journal of Economic Behavior & Organization 179, 566-588

	No event	Only positive event	Only positive event - No event (2) - (1)	Only negative event	Only negative event - No event (4) - (1)	Positive and negative events	Positive and negative events - No event (6) - (1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age (years)	48.36	36.66	-11.7***	52.24	3.88***	39.39	-8.97***
Male	0.48	0.47	-0.01	0.45	-0.02***	0.47	-0.01
Australia born	0.77	0.80	0.03***	0.79	0.01*	0.82	0.05***
Year 12	0.35	0.36	0.01	0.37	0.02***	0.38	0.04***
Vocational or Training qualification	0.13	0.20	0.07***	0.11	-0.02***	0.15	0.02***
Bachelor or higher	0.05	0.06	0.01***	0.04	-0.01***	0.05	0.00
Household size	2.91	2.94	0.04	2.69	-0.21***	2.80	-0.10***
Major city	0.62	0.65	0.03***	0.60	-0.02***	0.62	0.00
Local area unemployment rate (%)	5.13	5.06	-0.06*	5.17	0.04	5.13	0.00
Local area SEIFA index	5.62	5.88	0.26***	5.40	-0.22***	5.50	-0.12**
Locus of control (standardized)	0.09	0.15	0.06***	-0.10	-0.20***	-0.10	-0.19***
Observations	26,950	13,532		17,889		11,797	

Table 1: Sample means of key variables by major life event exposure status

Notes: Figures are sample means. "No event" group includes individuals who did not report any major life event during the study period. "Only positive event" group includes individuals who experienced only positive events and four ambiguous events. "Only negative event" group includes individuals who experienced only negative events. Tests are performed on the significance of the difference between the sample mean for two subgroups as respectively mentioned on the first row of the table. The symbol * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Regression at:	Mean	Q10th	Q20th	Q30th	Q40th	Q50th	Q60th	Q70th	Q80th	Q90th
Life event	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Got married	0.05**	-0.04	0.09**	0.07*	0.07**	0.10***	0.09***	0.06**	0.04**	0.02
	[0.03]	[0.05]	[0.04]	[0.04]	[0.03]	[0.03]	[0.03]	[0.03]	[0.02]	[0.04]
Separated from spouse	-0.16***	-0.39***	-0.19***	-0.17***	-0.13***	-0.14***	-0.12***	-0.09***	-0.06***	-0.04
	[0.02]	[0.06]	[0.05]	[0.04]	[0.03]	[0.03]	[0.02]	[0.02]	[0.01]	[0.03]
Got back together with spouse	-0.06	-0.16	-0.11	-0.07	-0.06	-0.03	-0.03	-0.02	-0.02	-0.07
	[0.04]	[0.12]	[0.08]	[0.07]	[0.06]	[0.05]	[0.04]	[0.04]	[0.03]	[0.05]
Pregnancy	0.10***	0.21***	0.10***	0.11***	0.07***	0.08***	0.06***	0.08***	0.07***	0.08**
	[0.02]	[0.04]	[0.03]	[0.03]	[0.03]	[0.02]	[0.02]	[0.02]	[0.02]	[0.04]
Birth/adoption of new child	0.01	-0.01	0.01	0.03	0.05	0.02	0.01	0.06**	0.02	0.02
	[0.02]	[0.04]	[0.03]	[0.03]	[0.03]	[0.03]	[0.04]	[0.03]	[0.02]	[0.04]
Serious personal injury/illness	-0.09***	-0.17***	-0.14***	-0.14***	-0.11***	-0.09***	-0.08***	-0.06***	-0.04***	-0.04*
	[0.01]	[0.04]	[0.02]	[0.02]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.02]
Serious injury/illness to family member	-0.04***	-0.04*	-0.06***	-0.07***	-0.05***	-0.06***	-0.04***	-0.04***	-0.02***	-0.01
	[0.01]	[0.02]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]
Death of spouse or child	-0.17***	-0.25*	-0.24***	-0.25***	-0.23***	-0.18***	-0.13***	-0.15***	-0.07**	-0.14**
	[0.06]	[0.13]	[0.08]	[0.07]	[0.06]	[0.05]	[0.05]	[0.04]	[0.03]	[0.06]
Death of close relative/family member	-0.03***	-0.03	-0.05***	-0.03*	-0.03**	-0.03**	-0.03***	-0.03**	-0.02***	-0.02
	[0.01]	[0.03]	[0.02]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]
Death of a close friend	-0.02	0.00	-0.02	-0.03	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
	[0.01]	[0.03]	[0.02]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]
Victim of physical violence	-0.18***	-0.46***	-0.36***	-0.29***	-0.18***	-0.09**	-0.05*	-0.06**	-0.04**	0.00
	[0.04]	[0.11]	[0.08]	[0.06]	[0.04]	[0.04]	[0.03]	[0.03]	[0.02]	[0.04]
Victim of a property crime	-0.04**	-0.10**	-0.07*	-0.07**	-0.06**	-0.06**	-0.04*	-0.02	-0.01	0.03
	[0.02]	[0.05]	[0.04]	[0.03]	[0.02]	[0.02]	[0.02]	[0.02]	[0.01]	[0.03]
Close family member detained in jail	-0.03	-0.10	-0.01	-0.08	-0.02	-0.04	-0.02	-0.03	-0.01	-0.07

Table 2: Estimates of major life events on internal locus of control at the mean and along the distribution

Regression at:	Mean	Q10th	Q20th	Q30th	Q40th	Q50th	Q60th	Q70th	Q80th	Q90th
Life event	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	[0.04]	[0.10]	[0.07]	[0.06]	[0.05]	[0.04]	[0.04]	[0.04]	[0.02]	[0.05]
Retired from the workforce	-0.01	0.01	-0.01	0.00	0.00	0.01	0.01	0.03	0.00	-0.01
	[0.03]	[0.06]	[0.04]	[0.04]	[0.03]	[0.02]	[0.02]	[0.02]	[0.02]	[0.04]
Fired or made redundant	-0.06***	-0.07	-0.09**	-0.09**	-0.07**	-0.06**	-0.05**	-0.03	-0.02	-0.05*
	[0.02]	[0.06]	[0.04]	[0.04]	[0.03]	[0.03]	[0.02]	[0.02]	[0.02]	[0.03]
Changed jobs	0.04***	0.07***	0.04**	0.05**	0.04**	0.04***	0.03**	0.02	0.01	0.01
	[0.01]	[0.02]	[0.02]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]
Promoted at work	0.03**	0.08***	0.04	0.04*	0.02	0.03*	0.02	0.01	0.00	0.00
	[0.01]	[0.03]	[0.03]	[0.02]	[0.02]	[0.02]	[0.02]	[0.02]	[0.01]	[0.03]
Major improvement in finances	0.06***	0.11**	0.10***	0.12***	0.10***	0.07**	0.06**	0.04*	0.03	0.01
	[0.02]	[0.05]	[0.03]	[0.03]	[0.03]	[0.03]	[0.02]	[0.02]	[0.02]	[0.03]
Major worsening in finances	-0.28***	-0.63***	-0.44***	-0.38***	-0.29***	-0.22***	-0.17***	-0.14***	-0.09***	-0.06**
	[0.03]	[0.08]	[0.07]	[0.04]	[0.03]	[0.03]	[0.02]	[0.02]	[0.02]	[0.03]
Changed residence	0.01	0.00	0.01	0.02	0.02	0.00	-0.01	0.01	0.01	-0.02
	[0.01]	[0.03]	[0.02]	[0.02]	[0.01]	[0.01]	[0.01]	[0.01]	[0.01]	[0.02]

Notes: Results for all life events reported in each quantile are from a separate FE quantile regression. Sample size: 70,168 observations from 18,330 unique persons. Life events are listed in the order prompted by the questionnaire. Other explanatory variables include age category dummies, education, household size, urban, local area socio-economic variables, state/territory dummies, wave dummies, and survey quarter dummies. Standard errors, reported in squared brackets, are obtained from bootstrapping (200 iterations) for quantile regressions and adjusted for clustering at individual level in regressions at the mean. The symbol * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.



Figure 1: Histogram of internal locus of control by major life event exposure status

Notes: "No event" group includes individuals who did not report any major life event during the study period. "Only positive event" group includes individuals who experienced only positive events and four ambiguous events. "Only negative event" group includes individuals who experienced only negative events. "N" denotes number of individuals in the respective subgroup.

Figure 2: Distribution of change in locus of control



Notes: "N" denotes number of individuals in the respective subgroup.



Figure 3: Estimates of major life events on internal locus of control at the mean and along the distribution

Notes: Results (estimates and their corresponding 95% confidence intervals, presented by whiskers and based on bootstrapping (200 iterations)) for all life events reported in each quantile are from a separate FE quantile regression. The dash (short dash dot) horizontal line shows the coefficient (95% confidence interval which is based on robust standard errors) estimates of the respective life event from an individual FE regression at the mean. Only life events with statistically significant estimates are presented. Life events are sorted in descending order by the absolute magnitude of the estimates at the mean. "N" denotes number of individuals affected by the respective event. Other explanatory variables include age category dummies, education, household size, urban, local area socio-economic variables, state/territory dummies, wave dummies, and survey quarter dummies. Regression results are reported in Table 2.



Figure 3: Estimates of major life events on internal locus of control at the mean and along the distribution (continued)

Notes: Results (estimates and their corresponding 95% confidence intervals, presented by whiskers and based on bootstrapping (200 iterations)) for all life events reported in each quantile are from a separate FE quantile regression. The dash (short dash dot) horizontal line shows the coefficient (95% confidence interval which is based on robust standard errors) estimates of the respective life event from an individual FE regression at the mean. Only life events with statistically significant estimates are presented. Life events are sorted in descending order by the absolute magnitude of the estimates at the mean. "N" denotes number of individuals affected by the respective event. Other explanatory variables include age category dummies, education, household size, urban, local area socio-economic variables, state/territory dummies, wave dummies, and survey quarter dummies. Regression results are reported in Table 2.



Figure 4: Heterogenous effects of major life events on internal locus of control at the mean

Notes: Results (estimates and their corresponding 95% confidence intervals which are based on robust standard errors) reported in each subgroup are from a separate individual FE regression at the mean. Life events are sorted ascendingly by the magnitude of the estimate of female subgroup. Unit of the estimate: SD. Other explanatory variables include age category dummies, education, household size, urban, local area socio-economic variables, state/territory dummies, wave dummies, and survey quarter dummies. Detailed regression results are reported in Appendix Table A4.



Figure 5: Dynamic effects of major life events on internal locus of control at the mean

Notes: Results (estimates and their corresponding 95% confidence intervals, presented as whiskers and based on clustered robust standard errors) reported for all events are from an individual FE regression at the mean. Life events are listed in the order prompted by the questionnaire. Sample size: 38,294 observations from unique 11,748 persons. Other explanatory variables include age category dummies, education, household size, urban, local area socio-economic variables, state/territory dummies, wave dummies, and survey quarter dummies.



Figure 5: Dynamic effects of major life events on internal locus of control at the mean (continued)

Notes: Results (estimates and their corresponding 95% confidence intervals, presented as whiskers and based on clustered robust standard errors) reported for all events are from an individual FE regression at the mean. Life events are listed in the order prompted by the questionnaire. Sample size: 38,294 observations from unique 11,748 persons. Other explanatory variables include age category dummies, education, household size, urban, local area socio-economic variables, state/territory dummies, wave dummies, and survey quarter dummies.

Online Appendix

for refereeing purposes and to be published online

Variable	Description	Mean	Min	Max		SD	
					Overall	Between	Within
Age	The respondent's age at the survey time (years)	45.58	15.00	100.00	17.98	18.16	4.82
Male	Dummy variable: = 1 if the individual is male and zero otherwise	0.47	0.00	1.00	0.50	0.50	0.00
Australia born	Dummy variable: = 1 if the individual was born in Australia and zero otherwise	0.79	0.00	1.00	0.41	0.41	0.00
Year 12	Dummy: = 1 if the individual completes Year 12 and zero otherwise	0.36	0.00	1.00	0.48	0.45	0.16
Vocational or Training qualification	Dummy: = 1 if the individual has a vocational or training qualification and zero otherwise	0.14	0.00	1.00	0.35	0.32	0.13
Bachelor or higher	Dummy: = 1 if the individual has a bachelor degree or higher and zero otherwise	0.05	0.00	1.00	0.21	0.20	0.08
Household size	Number of household members	2.84	1.00	14.00	1.44	1.23	0.79
Major city	Dummy variable: = 1 if the individual lives in a major city and zero otherwise	0.62	0.00	1.00	0.49	0.45	0.17
Local area unemployment rate	Yearly unemployment rate at the individual's residing local government area (%)	5.12	2.30	7.90	0.94	0.60	0.74
Local area SEIFA decile	Socio-Economic Indexes for Areas (SEIFA) decile at the individual's residing local government area	5.59	1.00	10.00	2.89	2.66	1.17
Locus of control	Standardized locus of control	0.02	-3.98	2.65	0.98	0.75	0.66
Got married	Dummy: = 1 if answering "Yes" to prompt "Got married" and zero if "No"	0.02	0.00	1.00	0.14	0.09	0.12
Separated from spouse	Dummy: = 1 if answering "Yes" to prompt "Separated from spouse or long-term partner" and zero if "No"	0.04	0.00	1.00	0.18	0.12	0.15
Got back together with spouse	Dummy: = 1 if answering "Yes" to prompt "Got back together with spouse or long-term partner after a separation" and zero if "No"	0.01	0.00	1.00	0.09	0.06	0.08
Pregnancy	Dummy: = 1 if answering "Yes" to prompt "Pregnancy / pregnancy of partner" and zero if "No"	0.05	0.00	1.00	0.22	0.14	0.18
Birth/adoption of new child	Dummy: = 1 if answering "Yes" to prompt "Partner or I gave birth to, or adopted, a new child" and zero if "No"	0.04	0.00	1.00	0.19	0.11	0.15
Serious personal injury/illness	Dummy: = 1 if answering "Yes" to prompt "Serious personal injury or illness to self" and zero if "No"	0.09	0.00	1.00	0.28	0.18	0.23
Serious injury/illness to family member	Dummy: = 1 if answering "Yes" to prompt "Serious personal injury or illness to a close relative / family member" and zero if "No"	0.15	0.00	1.00	0.36	0.22	0.29
Death of spouse or child	Dummy: = 1 if answering "Yes" to prompt "Death of spouse or child" and zero if "No"	0.01	0.00	1.00	0.09	0.05	0.07
Death of close relative/family member	Dummy: = 1 if answering "Yes" to prompt "Death of other close relative / family member (e.g. parent or sibling)" and zero if "No"	0.11	0.00	1.00	0.31	0.18	0.27
Death of a close friend	Dummy: = 1 if answering "Yes" to prompt "Death of a close friend" and zero if "No"	0.10	0.00	1.00	0.31	0.19	0.24

Appendix Table A1: Variable description and summary statistics

Variable	Description	Mean	Min	Max		SD	
					Overall	Between	Within
Victim of physical violence	Dummy: = 1 if answering "Yes" to prompt "Victim of physical violence (e.g. assault)" and zero if "No"	0.01	0.00	1.00	0.11	0.08	0.09
Victim of a property crime	Dummy: = 1 if answering "Yes" to prompt "Victim of a property crime (e.g. theft, housebreaking)" and zero if "No"	0.04	0.00	1.00	0.20	0.12	0.16
Close family member detained in jail	Dummy: = 1 if answering "Yes" to prompt "Close family member detained in a jail / correctional facility" and zero if "No"	0.01	0.00	1.00	0.12	0.08	0.09
Retired from the workforce	Dummy: = 1 if answering "Yes" to prompt "Retired from the workforce" and zero if "No"	0.02	0.00	1.00	0.15	0.09	0.13
Fired or made redundant	Dummy: = 1 if answering "Yes" to prompt "Fired or made redundant by an employer" and zero if "No"	0.03	0.00	1.00	0.17	0.11	0.14
Changed jobs	Dummy: = 1 if answering "Yes" to prompt "Changed jobs (i.e. employers)" and zero if "No"	0.13	0.00	1.00	0.33	0.23	0.26
Promoted at work	Dummy: = 1 if answering "Yes" to prompt "Promoted at work" and zero if "No"	0.06	0.00	1.00	0.24	0.15	0.19
Major improvement in finances	Dummy: = 1 if answering "Yes" to prompt "Major improvement in financial situation (e.g. won lottery, received an inheritance)" and zero if "No"	0.03	0.00	1.00	0.17	0.10	0.15
Major worsening in finances	Dummy: = 1 if answering "Yes" to prompt "Major worsening in financial situation (e.g. went bankrupt)" and zero if "No"	0.03	0.00	1.00	0.16	0.10	0.13
Changed residence	Dummy: = 1 if answering "Yes" to prompt "Changed residence" and zero if "No"	0.16	0.00	1.00	0.37	0.24	0.29

Notes: Statistics are calculated from the baseline sample of 70,168 observations from 18,330 unique persons.

Appendix Table A2: Correlation	matrix among	major life	events
--------------------------------	--------------	------------	--------

	Got marrie d	Separat ed from spouse	Got back togethe r with spouse	Pregna ncy	Birth/adop tion of new child	Serious personal injury/ill ness	Serious injury/ill ness to family member	Death of spouse or child	Death of close relative/fa mily member	Death of a close friend	Victim of physic al violenc e	Victim of a propert y crime	Close family membe r detaine d in	Retired from the workfo rce	Fired or made redund ant	Change d jobs	Promot ed at work	Major improve ment in finances	Major worseni ng in finance s	Change d residen ce
Got married	1.00												jail							
Separated from spouse	-0.01	1.00																		
Got back together with spouse		0.26	1.00																	
Pregnancy	0.10		0.02	1.00																
Birth/adoption of new child	0.04		0.01	0.60	1.00															
Serious personal injury/illness	-0.01	0.03	0.03	-0.02	-0.02	1.00														
Serious injury/illness to family member		0.01	0.02			0.11	1.00													
Death of spouse or child	0.01	0.03	0.03	0.04	0.02	0.03	0.07	1.00												
Death of close relative/family member			0.01			0.03	0.16	0.06	1.00											
Death of a close friend	-0.01		0.01	-0.03	-0.03	0.06	0.08	0.05	0.10	1.00										
Victim of physical violence		0.12	0.07			0.06	0.04	0.03	0.03	0.04	1.00									
Victim of a property crime	0.01	0.04	0.03	0.01		0.02	0.04		0.01	0.02	0.11	1.00								
Close family member detained in jail		0.03	0.03	0.02	0.01	0.02	0.04	0.03	0.04	0.04	0.07	0.04	1.00							
Retired from the workforce	0.01	0.02		-0.02	-0.02	0.06	0.01	0.05	0.02	0.04	0.01		0.02	1.00						
Fired or made redundant		0.04	0.03	0.01	0.01	0.02	0.02	0.01	0.02		0.05	0.03	0.02	0.05	1.00					
Changed jobs	0.03	0.05	0.04	0.03		-0.01		-0.01		-0.03	0.03	0.04		-0.04	0.25	1.00				
Promoted at work	0.04	0.02	0.01	0.02	0.02	-0.02				-0.03	0.02	0.03	0.01	-0.03		0.07	1.00			
Major improvement in finances		0.01	0.01			0.01	0.03	0.03	0.10	0.01	0.02		0.01	0.03	0.02	0.04	0.05	1.00		
Major worsening in finances		0.09	0.04	0.01	0.02	0.08	0.05	0.02	0.02	0.03	0.08	0.05	0.04	0.03	0.13	0.08	-0.01		1.00	
Changed residence	0.07	0.14	0.06	0.10	0.07					-0.03	0.06	0.05	0.02		0.05	0.19	0.08	0.03	0.06	1.00

Notes: Only correlation which is statistically significant at the 5% level or higher is listed. Sample size: 70,168 observations from 18,330 unique persons.

Appendix	Table A	43: Ro	obustness	checks
----------	---------	--------	-----------	--------

	Baseline	Dealing with multiple hypothesis testing issue	Including each event separately	Applying a pooled regression model	Sample 1: individuals aged 25 or older	Sample 2: Individuals aged under 25	Using the same model as in Cobb- Clark and Schurer	Using the s in Cobb-Cl	ame model an ark and Schur	d sample as er (2013) ^(a)
		(adjusted p-value)					(2013) ^(a)	Pooled sample	Female	Male
Life event	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Got married	0.05**	0.06	0.07***	0.05*	0.05*	-0.09	0.05**	0.04	0.07	0.01
	[0.03]		[0.03]	[0.03]	[0.03]	[0.08]	[0.02]	[0.05]	[0.08]	[0.07]
Separated from spouse	-0.16***	0.00	-0.19***	-0.22***	-0.19***	-0.03	-0.06***	-0.08*	-0.07	-0.10
	[0.02]		[0.02]	[0.02]	[0.03]	[0.05]	[0.02]	[0.05]	[0.07]	[0.07]
Got back together with spouse	-0.06	0.23	-0.15***	-0.12**	0.00	-0.37***	-0.09**	-0.23**	-0.22	-0.23*
	[0.04]		[0.04]	[0.05]	[0.05]	[0.10]	[0.04]	[0.09]	[0.14]	[0.12]
Pregnancy	0.10***	0.00	0.10***	0.10***	0.08***	0.23***	0.01	-0.03	-0.07	0.01
	[0.02]		[0.02]	[0.02]	[0.02]	[0.07]	[0.02]	[0.04]	[0.06]	[0.06]
Birth/adoption of new child	0.01	0.56	0.06***	0.04**	0.02	-0.16*	0.00	-0.05	-0.09	-0.02
	[0.02]		[0.02]	[0.02]	[0.02]	[0.09]	[0.02]	[0.04]	[0.06]	[0.06]
Serious personal injury/illness	-0.09***	0.00	-0.11***	-0.25***	-0.09***	-0.07	-0.07***	-0.06*	-0.04	-0.09*
	[0.01]		[0.01]	[0.02]	[0.01]	[0.05]	[0.01]	[0.03]	[0.05]	[0.05]
Serious injury/illness to family member	-0.04***	0.00	-0.05***	-0.08***	-0.04***	-0.05	-0.04***	-0.09***	-0.11***	-0.05
	[0.01]		[0.01]	[0.01]	[0.01]	[0.03]	[0.01]	[0.03]	[0.04]	[0.04]
Death of spouse or child	-0.17***	0.01	-0.19***	-0.24***	-0.14**	-0.43*	0.03	-0.04	-0.14	0.12
	[0.06]		[0.06]	[0.06]	[0.06]	[0.24]	[0.05]	[0.13]	[0.16]	[0.21]
Death of close relative/family member	-0.03***	0.00	-0.04***	-0.05***	-0.04***	-0.06*	0.00	-0.02	0.00	-0.04
	[0.01]		[0.01]	[0.01]	[0.01]	[0.04]	[0.01]	[0.03]	[0.04]	[0.04]
Death of a close friend	-0.02	0.23	-0.03**	-0.04***	-0.01	-0.04	-0.04***	-0.03	-0.08*	0.03
	[0.01]		[0.01]	[0.01]	[0.01]	[0.04]	[0.01]	[0.03]	[0.04]	[0.05]
Victim of physical violence	-0.18***	0.00	-0.24***	-0.40***	-0.19***	-0.14**	-0.12***	-0.19**	-0.11	-0.29**
	[0.04]		[0.04]	[0.04]	[0.05]	[0.07]	[0.04]	[0.08]	[0.12]	[0.11]
Victim of a property crime	-0.04**	0.02	-0.06***	-0.11***	-0.04**	-0.05	-0.05***	-0.04	-0.08	0.00

	Baseline	Dealing with multiple hypothesis testing issue (adjusted	Including each event separately	Applying a pooled regression model	Sample 1: individuals aged 25 or older	Sample 2: Individuals aged under 25	Using the same model as in Cobb- Clark and Schurer (2013) ^(a)	Using the same model and same in Cobb-Clark and Schurer (2)		d sample as er (2013) ^(a)
		p-value)					· · ·	sample	Female	Male
Life event	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	[0.02]		[0.02]	[0.02]	[0.02]	[0.04]	[0.02]	[0.04]	[0.06]	[0.05]
Close family member detained in jail	-0.03	0.48	-0.07*	-0.12***	-0.05	0.05	-0.05	0.04	-0.07	0.23*
	[0.04]		[0.04]	[0.04]	[0.04]	[0.09]	[0.04]	[0.08]	[0.10]	[0.13]
Retired from the workforce	-0.01	0.80	-0.03	-0.03	-0.01	0.08	-0.06**	-0.11*	-0.12	-0.11
	[0.03]		[0.03]	[0.03]	[0.03]	[0.26]	[0.03]	[0.06]	[0.09]	[0.09]
Fired or made redundant	-0.06***	0.02	-0.08***	-0.16***	-0.06**	-0.06	-0.03	-0.05	-0.07	-0.02
	[0.02]		[0.02]	[0.02]	[0.02]	[0.06]	[0.02]	[0.06]	[0.09]	[0.07]
Changed jobs	0.04***	0.00	0.02**	0.03***	0.05***	0.03	0.03***	0.01	-0.05	0.07*
	[0.01]		[0.01]	[0.01]	[0.01]	[0.03]	[0.01]	[0.03]	[0.04]	[0.04]
Promoted at work	0.03**	0.02	0.03**	0.11***	0.05***	0.00	0.04***	0.04	0.06	0.02
	[0.01]		[0.01]	[0.01]	[0.01]	[0.04]	[0.01]	[0.03]	[0.05]	[0.05]
Major improvement in finances	0.06***	0.00	0.06***	0.07***	0.07***	0.02	0.06***	0.03	0.00	0.06
	[0.02]		[0.02]	[0.02]	[0.02]	[0.06]	[0.02]	[0.04]	[0.06]	[0.06]
Major worsening in finances	-0.28***	0.00	-0.32***	-0.54***	-0.29***	-0.26***	-0.15***	-0.12**	-0.08	-0.17*
	[0.03]		[0.03]	[0.03]	[0.03]	[0.10]	[0.02]	[0.06]	[0.08]	[0.09]
Changed residence	0.01	0.48	0.00	0.00	0.02	-0.01	0.03**	0.02	0.04	-0.02
	[0.01]		[0.01]	[0.01]	[0.01]	[0.03]	[0.01]	[0.03]	[0.04]	[0.04]
Observations	70,168		70,168	70,168	59,999	10,169	34,893	6,853	3,669	3,184
R-squared	0.017		0.011	0.052	0.016	0.026	0.003	0.009	0.014	0.013

Notes: Estimates for each column is from a separate individual FE regression, unless indicated otherwise. Unless stated otherwise, other variables include age category dummies, marital status, education, household size, state/territory dummies, year dummies, and survey quarter dummies. ^(a) indicates that each life event mentioned in the first column takes the value of 1 if an individual reports experiencing the specific life event at any point in the three years preceding the current year, and 0 otherwise. The R-squared values reported in Columns 3, 5, 6, 7, and 8 represent the maximum R-squared values obtained from all separate regressions that include each life event individually. "Adjusted p-values" reported in Column 2 to account for multiple inference issue calculated using the Simes-Benjamini-Hochberg method. Robust standard errors clustered at the individual level in squared brackets. The symbol * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Separate regression for:	Female	Male	Younger	Older
Life event	(1)	(2)	(3)	(4)
Got married	0.04	0.06*	0.08***	-0.03
	[0.04]	[0.04]	[0.03]	[0.08]
Separated from spouse	-0.15***	-0.17***	-0.12***	-0.21***
	[0.03]	[0.03]	[0.03]	[0.05]
Got back together with spouse	-0.13**	0.04	-0.07	-0.10
	[0.06]	[0.07]	[0.05]	[0.09]
Pregnancy	0.12***	0.07***	0.09***	0.26*
	[0.02]	[0.02]	[0.02]	[0.15]
Birth/adoption of new child	0.02	0.00	0.01	-0.04
	[0.03]	[0.03]	[0.02]	[0.12]
Serious personal injury/illness	-0.10***	-0.08***	-0.09***	-0.09***
	[0.02]	[0.02]	[0.02]	[0.02]
Serious injury/illness to family member	-0.04***	-0.03**	-0.04***	-0.03*
	[0.01]	[0.01]	[0.01]	[0.01]
Death of spouse or child	-0.16**	-0.18**	-0.22**	-0.14**
-	[0.07]	[0.08]	[0.09]	[0.07]
Death of close relative/family member	-0.03**	-0.04**	-0.03**	-0.02
	[0.02]	[0.02]	[0.02]	[0.02]
Death of a close friend	-0.02	-0.01	-0.05**	0.00
	[0.02]	[0.02]	[0.02]	[0.02]
Victim of physical violence	-0.20***	-0.15***	-0.21***	-0.12
	[0.05]	[0.05]	[0.04]	[0.09]
Victim of a property crime	-0.07***	-0.02	-0.02	-0.08***
	[0.03]	[0.02]	[0.02]	[0.03]
Close family member detained in jail	-0.06	0.02	-0.02	-0.04
	[0.05]	[0.06]	[0.05]	[0.06]
Retired from the workforce	0.05	-0.07*	0.03	-0.01
	[0.04]	[0.04]	[0.10]	[0.03]
Fired or made redundant	-0.07**	-0.04	-0.07**	-0.06
	[0.03]	[0.03]	[0.03]	[0.04]
Changed jobs	0.04***	0.04**	0.03**	0.07***
	[0.01]	[0.02]	[0.01]	[0.03]
Promoted at work	0.04*	0.03*	0.03**	0.02
	[0.02]	[0.02]	[0.02]	[0.03]
Major improvement in finances	0.03	0.10***	0.06**	0.04
	[0.03]	[0.03]	[0.03]	[0.03]
Major worsening in finances	-0.27***	-0.30***	-0.27***	-0.30***
	[0.04]	[0.04]	[0.04]	[0.04]
Changed residence	0.02	-0.01	0.00	0.02
	[0.01]	[0.01]	[0.01]	[0.02]
Observations	37,303	32,865	36,121	34,047
Number of unique persons	9,654	8,676	11,812	10,089
Mean of dependent variable	-0.0006	0.0432	0.0263	0.0130

Appendix Table A4:	Heterogenous	effects of	life events	on locus of	control a	t the mean
± ±	0					

Notes: Results for each subgroup are from a separate FE regression at the mean. Life events are listed in the order prompted by the questionnaire. Other explanatory variables include age category dummies, education, household size, urban, local area socio-economic variables, state/territory dummies, wave dummies, and survey quarter dummies. Standard errors, reported in squared brackets, adjusted for clustering at individual level. The symbol * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Variables	Estimates	Variables	Estimates
	[S.E.]		[S.E.]
(1)	(2)	(3)	(4)
Got married	0.05*	Victim of a property crime	-0.04**
	[0.03]		[0.02]
Separated from spouse	-0.16***	Close family member detained in jail	-0.03
	[0.02]		[0.04]
Got back together with spouse	-0.06	Retired from the workforce	0.00
	[0.04]		[0.03]
Pregnancy	0.09***	Fired or made redundant	-0.06***
	[0.02]		[0.02]
Birth/adoption of new child	0.02	Changed jobs	0.04***
	[0.02]		[0.01]
Serious personal injury/illness	-0.09***	Promoted at work	0.03**
	[0.01]		[0.01]
Serious injury/illness to family member	-0.04***	Major improvement in finances	0.05***
	[0.01]		[0.02]
Death of spouse or child	-0.17***	Major worsening in finances	-0.29***
	[0.06]		[0.03]
Death of close relative/family member	-0.04***	Changed residence	0.01
	[0.01]		[0.01]
Death of a close friend	-0.02	Household income (log)	0.03***
	[0.01]		[0.01]
Victim of physical violence	-0.18***	Observations	69,928
	[0.04]	Number of unique persons	18,329

Appendix Table A5: Estimates of life events and household income on internal locus of control at the mean

Notes: Estimates are from an individual FE regression. Other variables include age category dummies, marital status, education, household size, state/territory dummies, year dummies, and survey quarter dummies. Robust standard errors clustered at the individual level in squared brackets. The symbol * denotes significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Appendix Figure A1: Pooled and fixed effects estimates of major life events on internal locus of control at the mean



Notes: Results (estimates and their corresponding 95% confidence intervals which are based on robust standard errors) reported in each specification are from a separate regression at the mean. Life events are sorted ascendingly by the magnitude of the FE estimates. Other explanatory variables include age category dummies, education, household size, urban, local area socio-economic variables, state/territory dummies, wave dummies, and survey quarter dummies. Gender and migration status are additional explanatory variables for the pooled OLS regression.