

Do changes in the lives of our peers make us unhappy?

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Synopsis

Research Question and Objective of this research: explain the changes in aggregate happiness over the lifecycle; **Aggregate Model of Happiness.**

Data: panel data from the Household Income and Labour Dynamics for Australia (HILDA waves 2 to 6); construct an stress index of the severity of life changes for ages 15 to 84.

Reflect on results based on a model of individual level happiness

$$GS_{it} = C + \beta_1 Age_{it} + \beta_2 Age_{it}^2 + \alpha X_{it} + F_i + L_{is} + \varepsilon_{it} \quad (1)^1$$

After a decade, economists have minimally explained happiness:

(see Clark, Frijters, & Shields, 2008 for a survey)

Di Tella, MacCulloch, & Oswald (2001, p.340)

12 western European countries, N=250,000

Using 23 variables

Blanchflower & Oswald (2004)

US General Social Survey, N=32,825

Using sixteen variables

Frijters & Beatton (2008)

GSOEP, N=178,770

Using a kitchen sink of variables

1 (Frijters, Johnston, & Shields, 2008)

C (Easterlin, 2006; Fujita & Diener, 2005; Headey, 2007)

Age, Age² (Blanchflower & Oswald, 2007)

L (Headey, 2008; Suh, Diener, & Fujita, 1996)

F (Sahoo, Sahoo, & Harichandan, 2005)

Reflect on results based on a model of individual level happiness

Table 3: The determinants of Life Satisfaction for West-Germans in the GOESP; Pooled Regression – entire sample, N = 176,770

Variable:	Age		Age + Age ²		Usual Suspects		Usual Suspects+Health		Kitchen Sink	
	coefficient	t-value	coefficient	t-value	coefficient	t-value	coefficient	t-value	coefficient	t-value
age	-0.0059	22.68	-0.0217	15.69	-0.0541	32.8	-0.0600	36.77	-0.0454	25.64
age*age			0.0002	11.63	0.0005	29.2	0.0006	34.13	0.0005	25.39
income					0.4619	52.2	0.4420	45.91	0.4307	44.53
male					-0.0603	6.3	-0.0719	7.60	-0.0719	7.47
education					0.0249	13.7	0.0227	12.47	0.0204	11.17
number of children					-0.0640	13.1	-0.0498	10.30	-0.0382	7.50
married					0.3106	27.9	0.2915	26.50	0.1180	7.65
employed					0.0650	4.8	0.0791	5.88	0.0688	5.11
non-participant					-0.0033	0.2	-0.0027	0.19	-0.0305	2.14
unemployed					-1.0076	42.3	-0.9508	40.37	-0.9225	38.37
regional income							-0.0001	11.24	-0.0001	11.15
home owner							0.0943	8.45	0.0956	8.58
asset income							0.0000	1.95	0.0000	1.87
imputed rent							0.0000	15.60	0.0000	15.23
health							-0.0228	30.42	-0.0231	30.71
invalid							-1.2427	55.93	-1.2444	56.12
family death									-0.3158	4.69
divorce									-0.2558	10.63
separated									-0.4539	11.26
partner dead									-0.0468	1.84
just married									0.4061	13.70
just divorced									0.0474	0.75
just separated									-0.4112	9.92
spouse just died									-0.9895	10.55
just had a baby									0.1354	5.65
pregnant									0.2118	5.05
just fired from job									-0.2747	7.86
constant	7.4165	602.43	7.7472	249.95	4.2642	53.5	4.8670	58.03	4.7469	56.33
R ²	0.00		0.00		0.0481		0.07		0.08	

Summary of Reflection on the model of individual level happiness

The kitchen sink of variables we use do not explain much

Missing Variables

Measurement Error

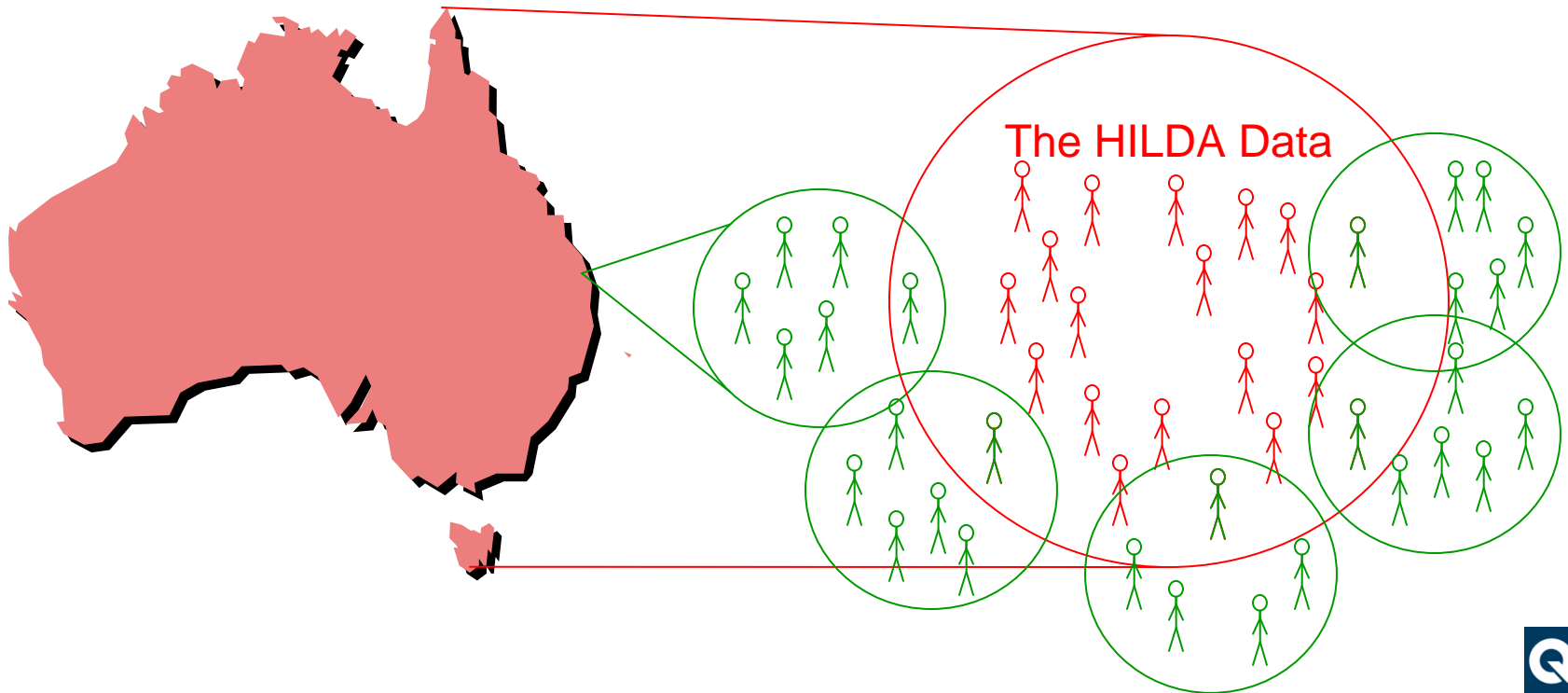
&

Peer Effects¹

¹(Powdthavee, 2007)

Reflect on the model of individual level happiness

Peer Effects: We adjudge our happiness relative to those with whom we compare (Easterlin, 2001; Falk & Knell, 2004)



Review Happiness Theory

- Economics: The degree to which an individual judges overall quality of his or her life as favourable (Veenhoven, 1991, 1993).

Life Satisfaction (GS) is self-reported ordinal happiness in response to:

“All things considered, how satisfied are you with your life”

Fordyce Global Happiness Scale (1977 & 1978) 11-point scale

0 (very unhappy) to 10 (very happy)

Our self-reported Happiness is an aggregate measure of all the good and bad things that happen to us in our lives

(Fordyce, 1988)

Perhaps we need a model that looks at happiness in the aggregate

Theoretical Framework for an Aggregate Model of Happiness

We start with our model of individual happiness, including peer effects:

$$GS_i = \beta X_i + \lambda X_{peer_i} + u_i \quad (1a)$$

where: $i \in P_{age}$

Individual characteristic peer effect

what is usually estimated in empirical happiness regressions is:

$$GS_{it} = \beta Z_{it} + v_{it} \quad (1b)$$

$$Z_{it} = X_{it} + e_{it}$$

what we get from our regression is:

$$\hat{\beta} = \left[\frac{\text{cov}(Z_{it}, GS_{it})}{\sigma_Z^2} \right] = \frac{\sigma_X^2 \beta}{\sigma_X^2 + \sigma_e^2} + \frac{\lambda \text{cov}(X_{it}, X_{peer_{it}})}{\sigma_X^2 + \sigma_e^2}$$

measurement error

peer effect



Theoretical Framework for an Aggregate Model of Happiness

We propose to estimate:
$$\frac{1}{N_{P_{age}}} \sum_{i \in P_{age}} GS_{it} = \beta \frac{1}{N_{P_{age}}} \sum Z_{it} + w_t \quad (1c)$$

where: $i \in P_{age}$

If we now presume:
$$\frac{1}{N_{P_{age}}} \sum X_{it} = \frac{1}{N_{P_{age}}} \sum X_{peer_{it}}$$

Asymptotic estimate of the parameter becomes:

$$\hat{\beta} = \underbrace{\beta}_{\text{Individual characteristic}} + \underbrace{\lambda}_{\text{peer effect}}$$

Limitation: 55,177 person-year observations are reduced to 70 (ages 15 to 84)

We need a Big Variable that encapsulates our Kitchen Sink of effects

Theoretical Framework for an Aggregate Model of Happiness – The Big Variable

Our self-reported Happiness is an aggregate measure of all the good and bad things that happen to us in our lives

(Fordyce, 1988)

life is a succession of little mishaps and triumphs that determine how we feel in the short-run, and big events that determine how we feel in the medium term (say, a year) (Easterlin, 2002; 2006).

Our ‘Big Variable’ is the *Stress*¹ arising from life events

H1: An Aggregate Model of Happiness based on the average stress from life events explains happiness over a lifetime.

Aggregate Model of Happiness

$$GS_t = C + \delta(Stress_t) + \varepsilon_t \quad ; t = age \quad (1)$$

GS_t Average Happiness at each age (15 to 84; $N = 70$)

C Constant (underlying level of happiness)

$Stress_t$ Stress from the [life event](#) shocks at each age (P_{age})

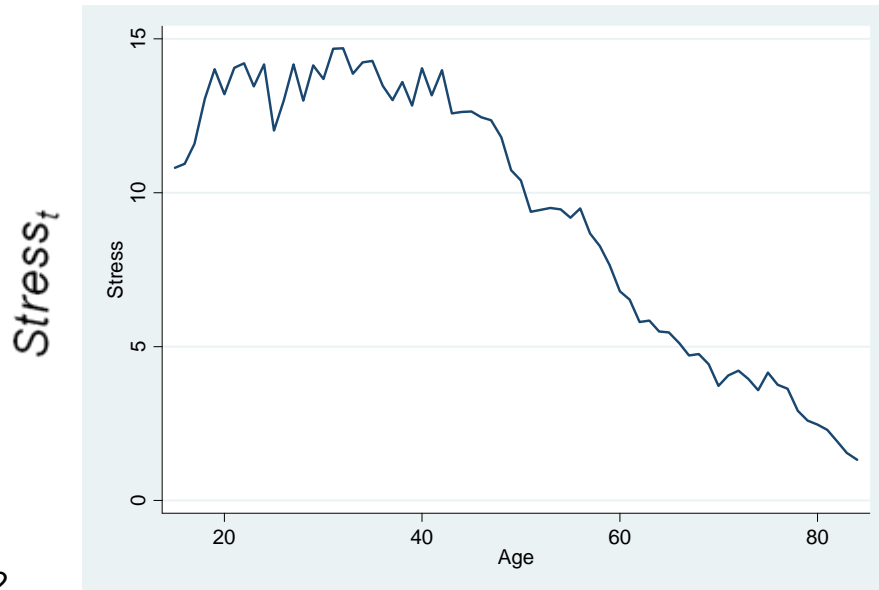
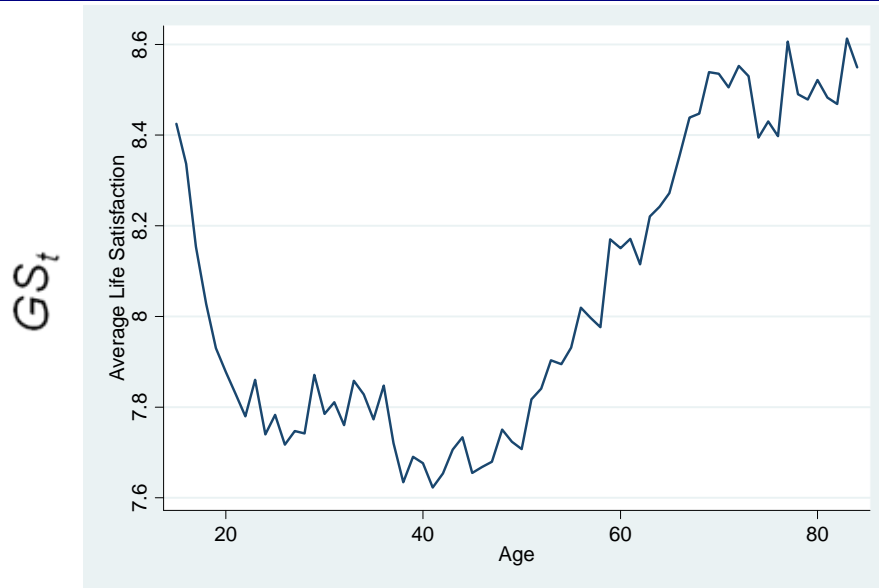
$$Stress_t = \frac{1}{N_{P_{age}}} \sum (L_{is} * SRRS) \quad 0 < \underline{SRRS}^1 < 1 \quad (1a)$$

ε_t error term

t

¹ (Carlopio, Andrewartha, Armstrong, & Whetten, 2001; UCLA, 2008)

Aggregate Model of Happiness - results



$$GS_t = C + \delta(Stress_t) + \varepsilon_t$$

8.67	-1.18
(215.43)	(17.21)
$R^2 = .81$	

H1: The stress from life events explains changes in happiness

H1a: Positive and Negative life events detract from our happiness.

$$GS_t = C + \delta_1(Positive_Stress_t) + \delta_2(Negative_Stress_t) + \varepsilon_t \quad (2)$$

8.73
(177.83)

-1.76
(5.13)

-.572
(1.58)

$R^2 = .82$

GS_t Average Happiness at each age (15 to 84; $N = 70$)

C Constant (underlying level of happiness)

$Positive_Stress_t$ Stress from the [positive life event shocks](#) at each age (t)

$Negative_Stress_t$ The Stress from the [negative life event shocks](#) at each age (t)

ε_t error term

Summary

Research Question and objective of this research: explain the changes in aggregate happiness over the lifecycle; **Aggregate Model of Happiness.**

Contribution: offered a solution to the problems of missing **peer effects and measurement error** that plague models of individual level happiness.

Data: panel data from the Household Income and Labour Dynamics for Australia (HILDA waves 2 to 6); construct an stress index of the severity of life changes for ages 15 to 84.

Results: 1) Stress Index **explains over 80% of variation in happiness** over time;
2) Unexpectedly, **aggregate 'positive stress'** (such as marriage rates by age or levels of job promotion) **has greater negative effect on aggregate life satisfaction than negative stress** (such as negative financial events or deaths of spouses).

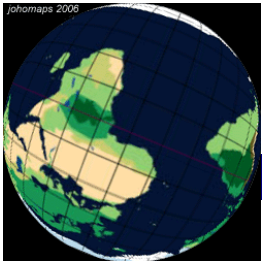
Interpretation: 1) a positive event by the person involved is a highly negative event for his or her peers.

Limitations: the disadvantage is a dramatic loss of degrees of freedom; a reliance on SRRS theory; all the life shocks that could affect us are not included.

Policy Implications: happiness maximising policy; reduce changes over the life cycle to the bare minimum needed to sustain a dynamic economy and to sustain procreation.



The Journey continues.....



Questions

References

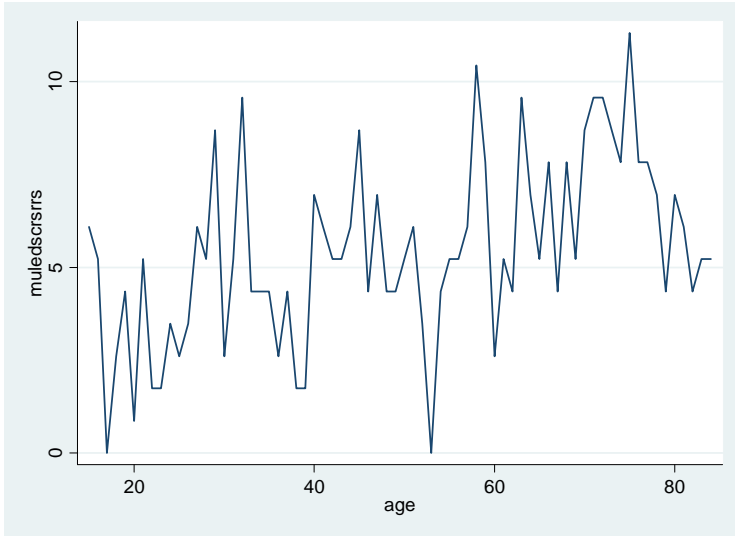
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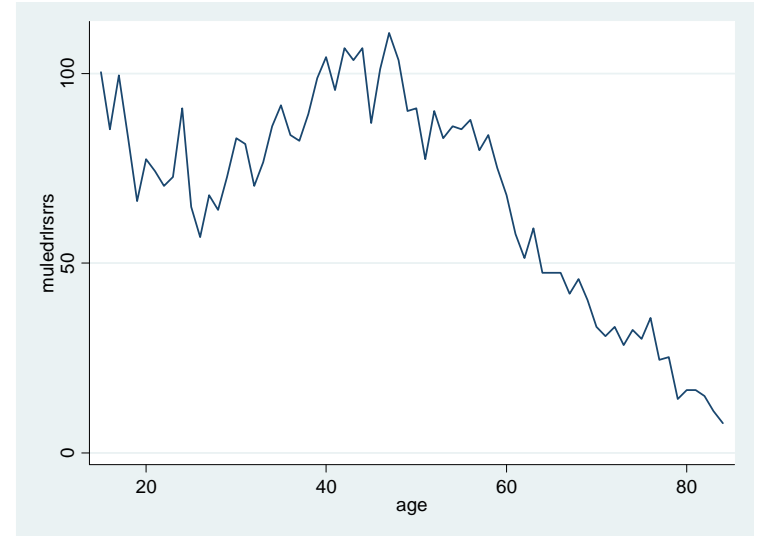
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The data used in this paper were extracted using the Add-On package PanelWhiz v1.0 (Oct 2007) for Stata. PanelWhiz was written by Dr. John P. Haisken-DeNew (john@panelwhiz.eu). The PanelWhiz generated DO file to retrieve the HILDA data used here and any Panelwhiz Plugins are available upon request. Any data or computational errors in this paper are my own. Haisken-DeNew and Hahn (2006) describe PanelWhiz in detail.

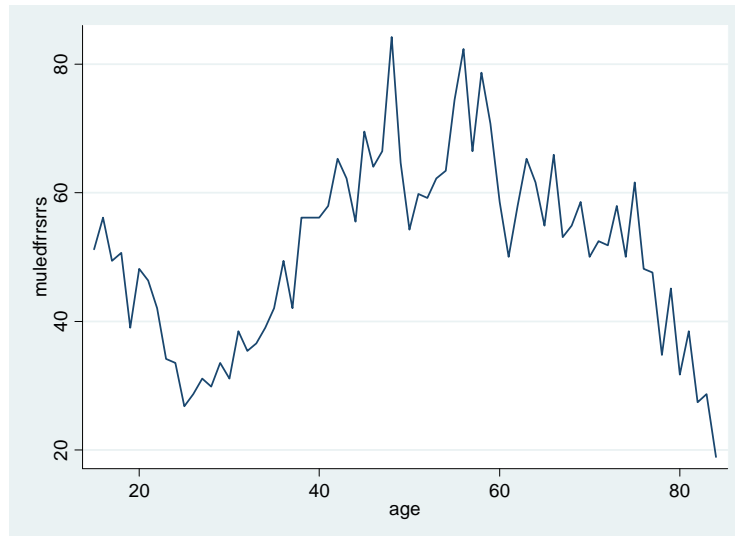
Stress from Lifetime Events over a Lifetime



Death of Spouse

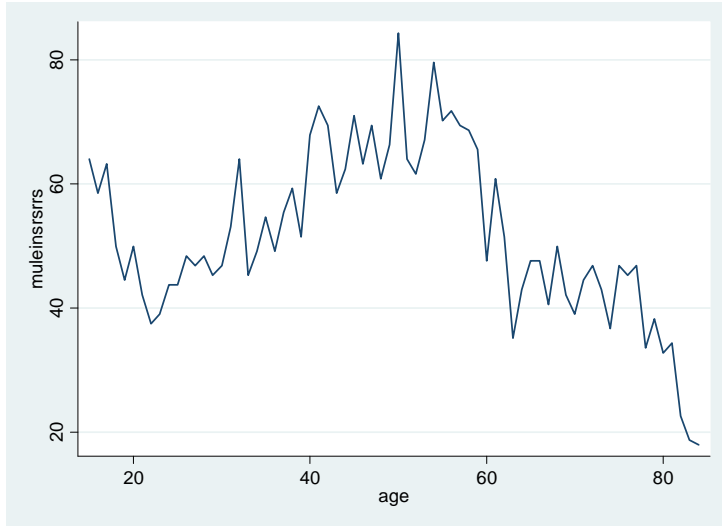


Death of Relative

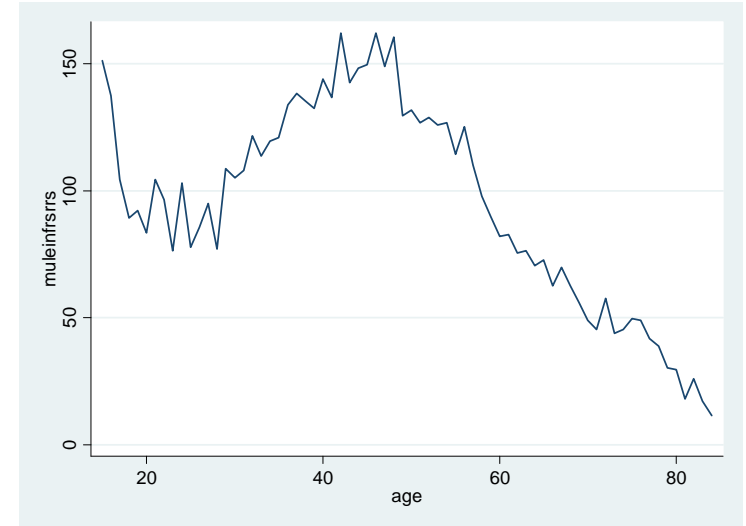


Death of Friend

Stress from Lifetime Events over a Lifetime

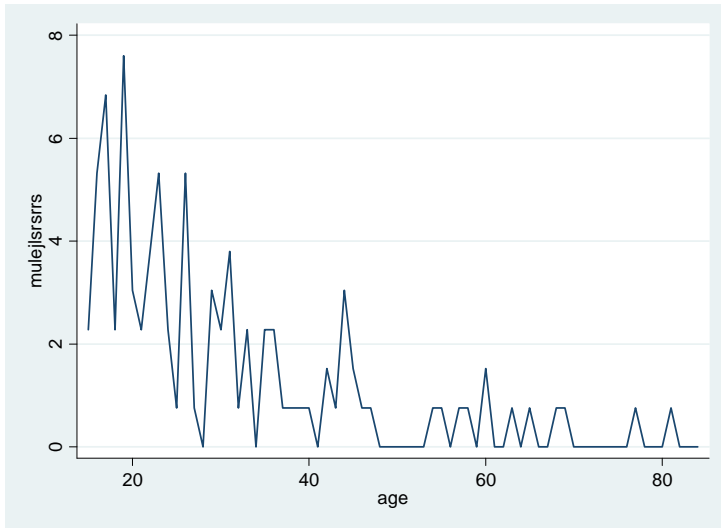


Personal Injury

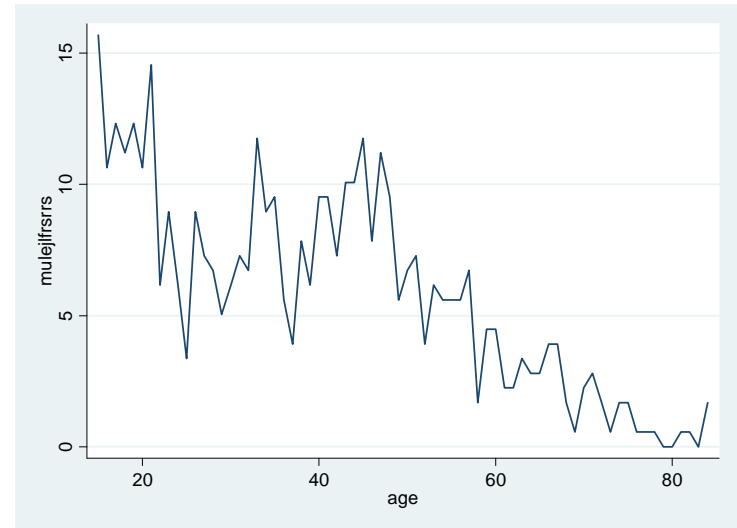


Injury to a Friend

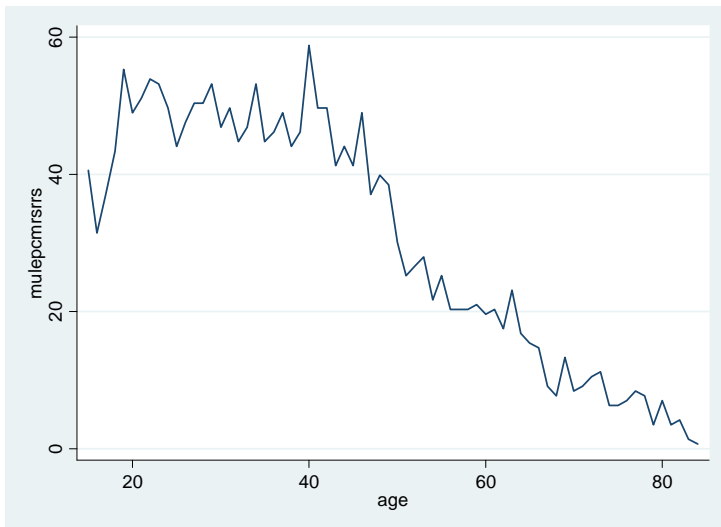
Stress from Lifetime Events over a Lifetime



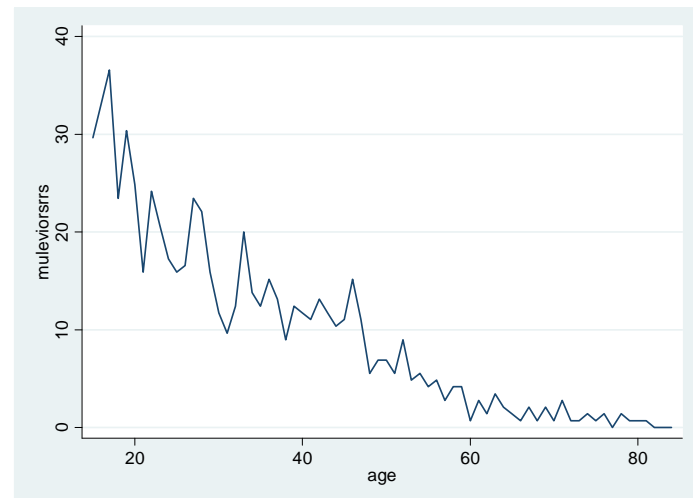
Sent to Jail



Friend sent to Jail

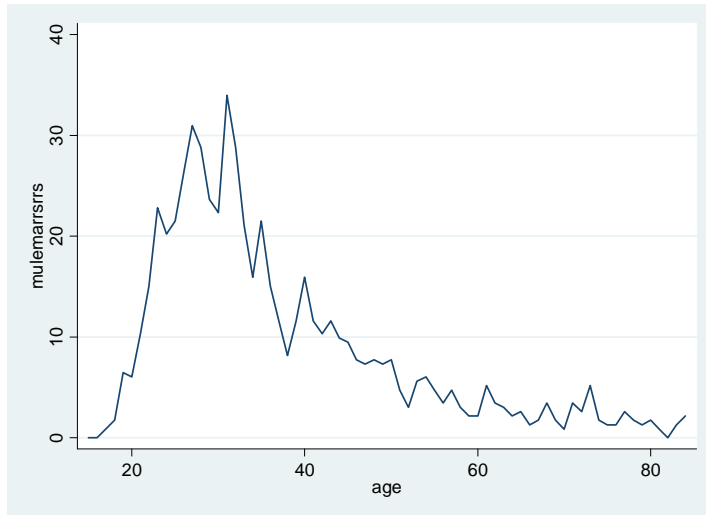


Victim of Property Crime

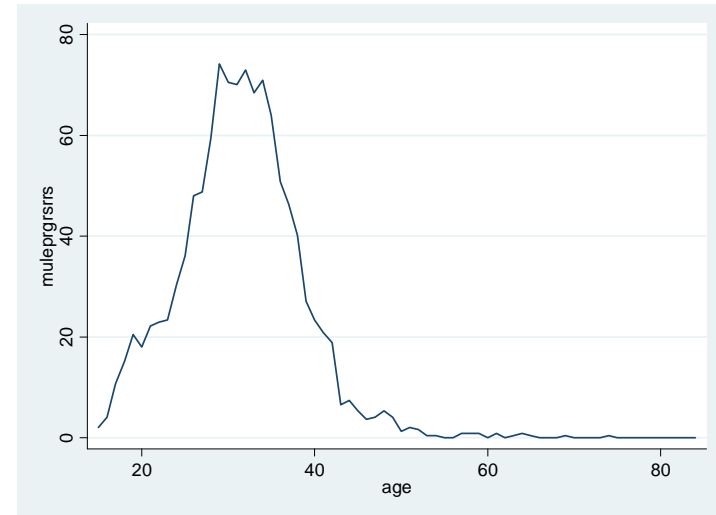


Victim of Violence

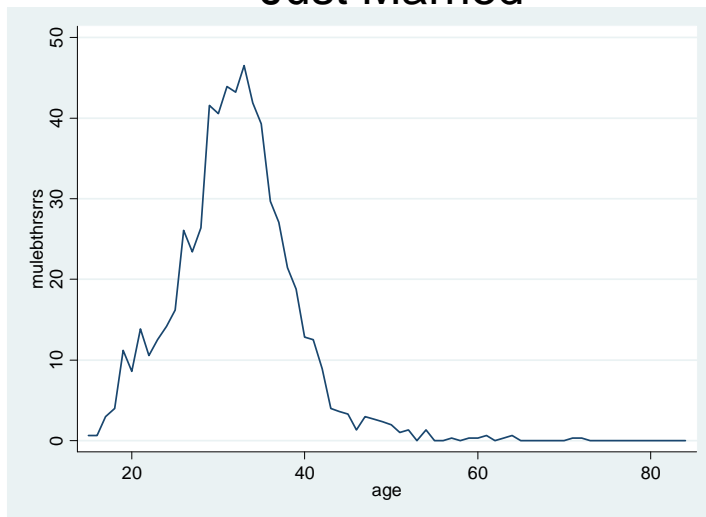
Stress from Lifetime Events over a Lifetime



Just Married

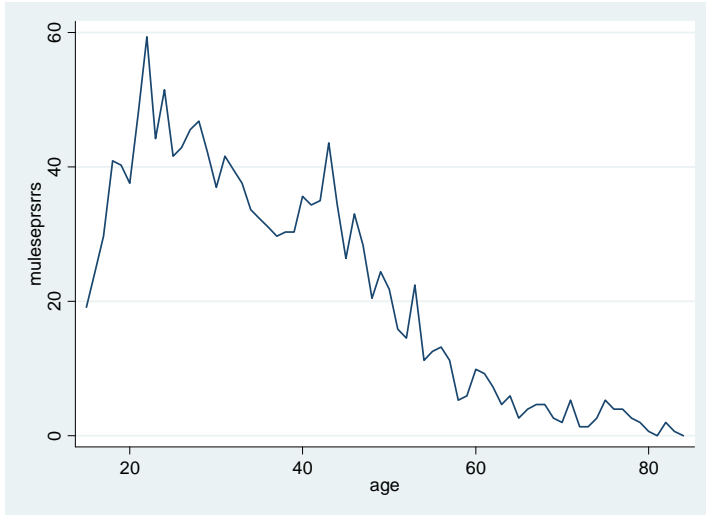


Self or Partner Pregnant

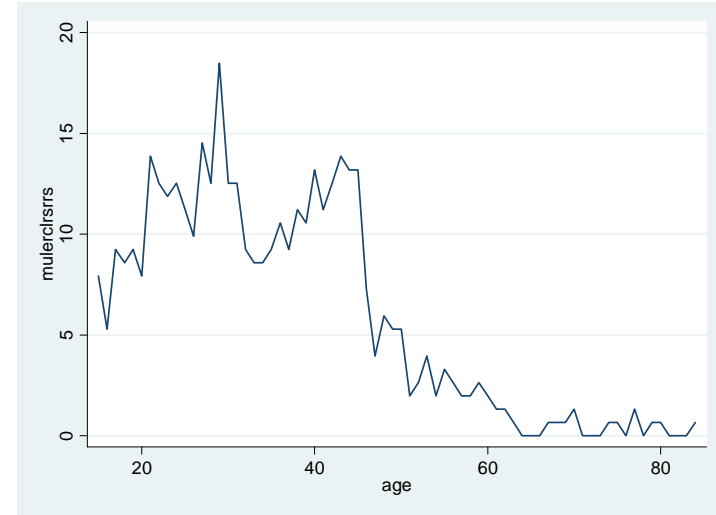


Birth of a Child

Stress from Lifetime Events over a Lifetime

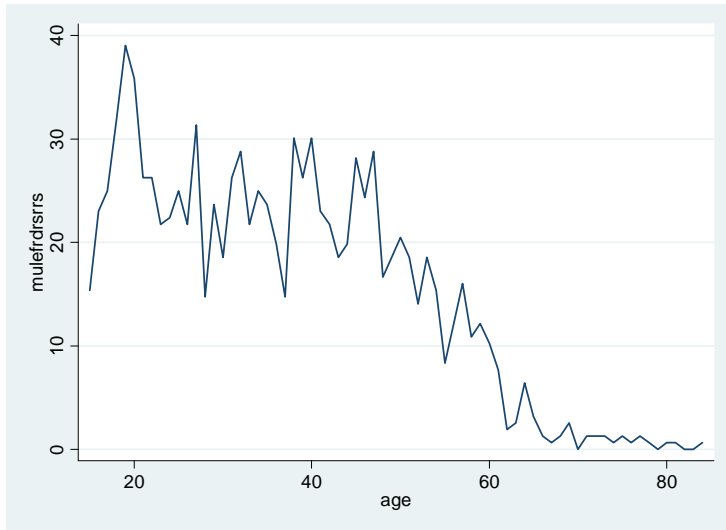


Just Separated

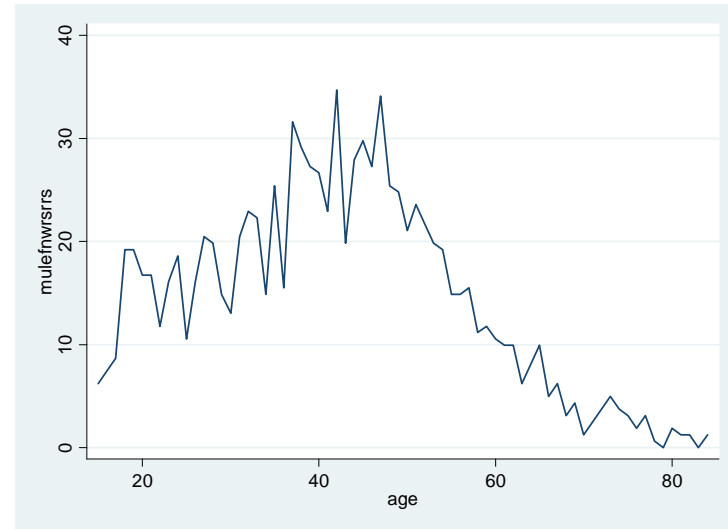


Reconciled

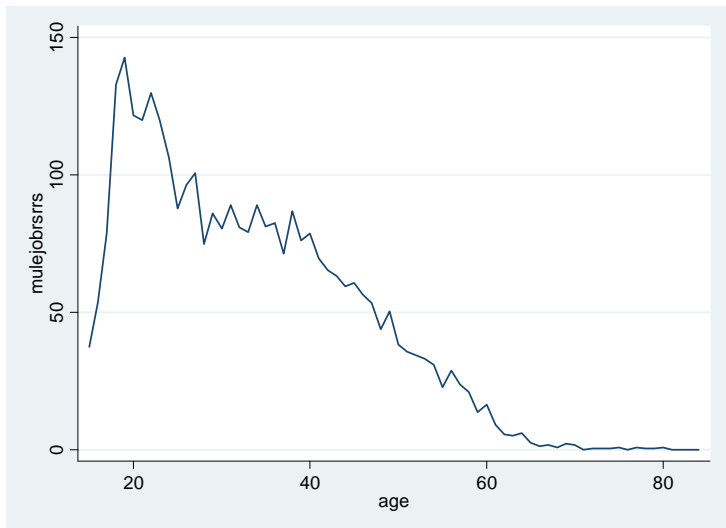
Stress from Lifetime Events over a Lifetime



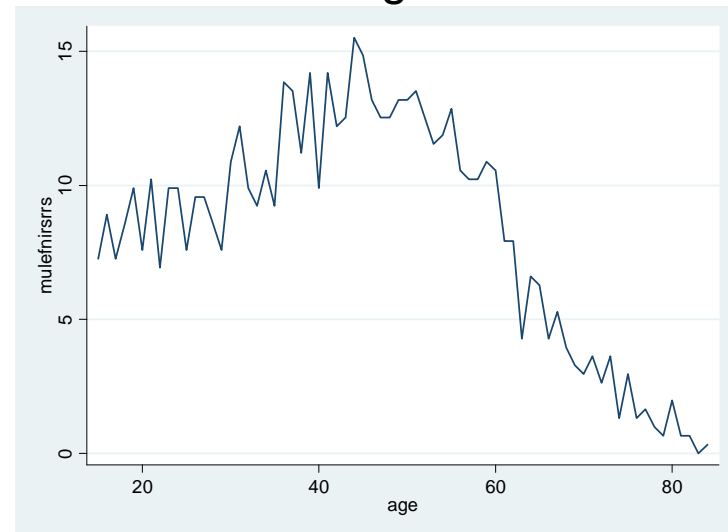
Just Fired



Worsening Finances

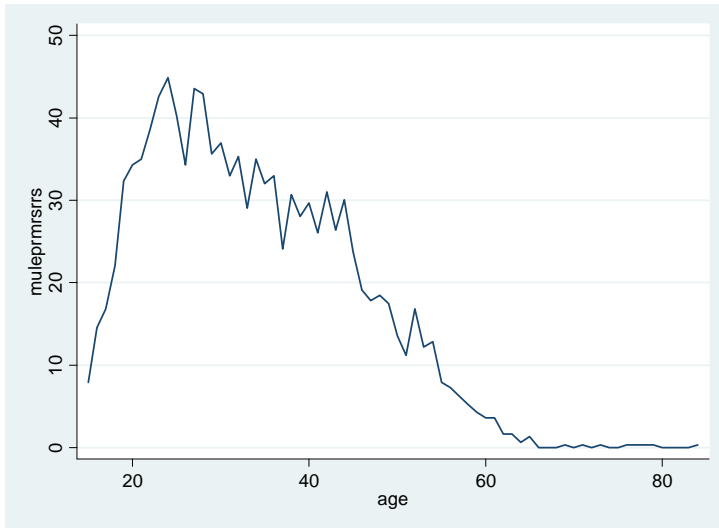


Changed Jobs

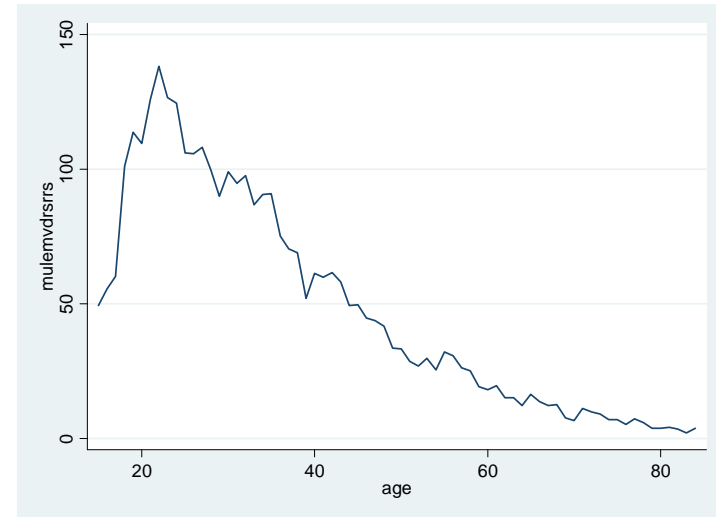


Improving Finances

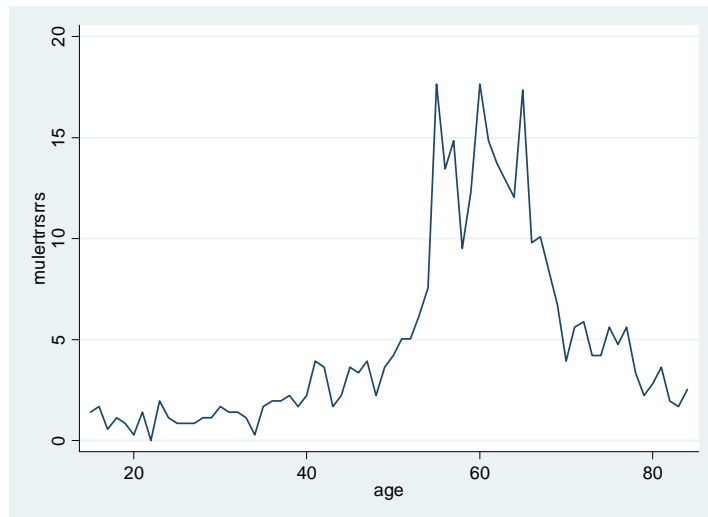
Stress from Lifetime Events over a Lifetime



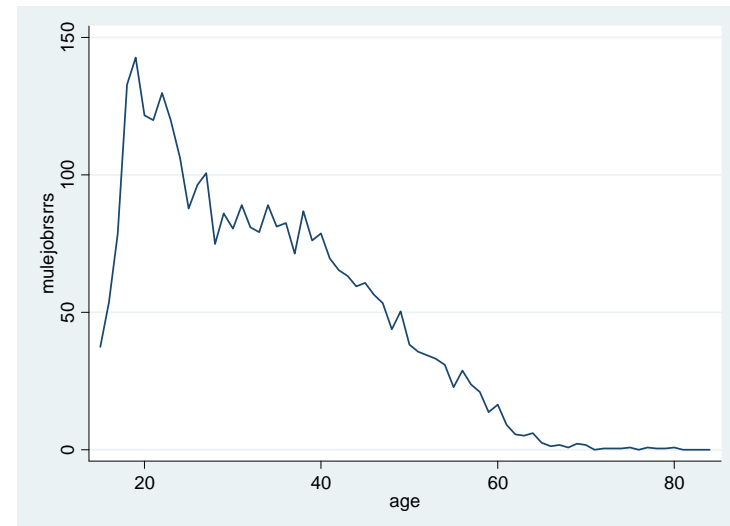
Just Promoted



Moving House



Just Retired



Changed Jobs

Life events in the HILDA

Table 2: Sample averages for life events affecting individuals in the HILDA⁶; N = 55,177

Variable:	Mean	s.d.	Min	Max
spouse/child death	.007	.078	0	.87
death of a relative	.086	.246	0	.79
personal injury	.067	.218	0	.78
jailing of self	.002	.034	0	.76
injury to a family member	.121	.296	0	.72
property crime victim	.039	.160	0	.70
victim of violence	.012	.091	0	.69
just separated	.027	.131	0	.66
just reconciled	.007	.070	0	.66
fired from job	.019	.108	0	.64
worsening finances	.018	.104	0	.62
death of friend	.066	.189	0	.61
friend jailed	.007	.064	0	.56
just married	.011	.068	0	.43
start new job	.059	.148	0	.43
just pregnant	.021	.089	0	.41
moving house	.061	.133	0	.35
improved finances	.011	.058	0	.33
promoted at work	.021	.081	0	.33
birth of child	.011	.060	0	.33
just retired	.006	.041	0	.28

Table 1: Stress levels from the Social Readjustment Rating Scale (SRRS)

SRRS	Life Event
.87	<i>Death of a spouse</i>
.79	<i>Death of a close family member</i>
.78	<i>Major injury or illness to self</i>
.76	<i>Detention in gaol or other institution</i>
.72	<i>Major injury or illness to close family member</i>
.71	Foreclosure on a loan/mortgage
.71	<i>Divorce</i>
.70	<i>Victim of crime</i>
.69	Victim of police brutality
.69	Infidelity
.69	<i>Experiencing domestic violence/sexual abuse</i>
.66	<i>Separation with spouse/mate</i>
.66	<i>reconciliation with spouse/mate</i>
.64	<i>Being fired/laid-off/unemployed</i>
.62	<i>Experiencing financial problems/difficulties</i>
.61	<i>Death of a close friend</i>
.59	Surviving a disaster
.59	Becoming a single parent
.56	Assuming responsibility for a sick or elderly loved one
.56	Loss or major reduction in health insurance/benefits
.56	<i>Self/close family member being arrested for violating the law</i>
.53	Major disagreement over child support/custody/visitation
.53	Experiencing/involved in a car accident
.53	Being disciplined at work/demoted
.51	Dealing with an unwanted pregnancy
.50	Adult Child moving in with parent/parent moving in with adult child
.49	Child develops behavioural or learning problems
.48	Experiencing employment discrimination/sexual harassment
.47	Attempting to modify addictive behaviour of self
.46	Discover/attempt to modify addictive behaviour of close family member
.45	Employer reorganising/downsizing
.44	Dealing with infertility/miscarriage
.43	<i>Getting married/remarried</i>
.43	<i>Changing employers/careers</i>
.42	Failure to obtain/qualify for a mortgage
.41	<i>Pregnancy of self/spouse</i>
.39	Experiencing discrimination/harassment outside the workplace
.39	Release from gaol
.38	Spouse/mate begins/ceases work outside home
.37	Major disagreement with boss or co-worker
.35	<i>Change in residence</i>
.34	Finding appropriate child care/day care

Table 8: The determinants of Life Satisfaction for Australians; Pooled OLS regression results for individuals in the HILDA waves 2 to 6; N = 55,177

Variable:	Age		Age + Age ²		+ Demographics		+ Life Events	
	coefficient	t-value	coefficient	t-value	coefficient	t-value	coefficient	t-value
age	.0080	22.24	-.0451	26.01	-.0478	22.81	-.0450	21.33
age*age			.0005	31.29	.0007	31.05	.0006	29.32
ln (weekly household income)					.0158	5.70	.0114	4.13
pension Income (\$)					-.0001	2.30	-.0001	1.72
female					.0853	7.16	.0857	7.24
education years					-.0622	17.99	-.0616	17.85
married					.1620	6.76	.1148	4.73
separated					-.6360	16.59	-.4891	12.50
never married					-.2031	8.36	-.1701	6.91
divorced					-.2288	7.56	-.2128	7.06
widowed					-.1641	4.24	-.1687	4.35
employed					-.1323	7.45	-.0881	5.20
unemployed					-.3826	11.12	-.2706	7.85
disability					-.0798	5.07	-.0591	3.77
health					.5140	72.02	.4923	68.89
health a year ago					.1252	13.98	.1233	13.85
spouse/child death							-.2995	4.01
death of a relative							.0184	0.77
personal injury							-.1268	4.62
jailing of self							.0379	0.23
injury to a family member							-.0876	4.03
property crime victim							-.2560	7.08
victim of violence							-.5945	9.20
just separated							-.5987	12.40
just reconciled							-.1893	2.20
fired from job							-.2474	4.46
worsening finances							-1.2115	21.54
death of friend							.0938	3.04
friend jailed							.0880	0.97
just married							.3015	3.48
start new job							-.1504	3.55
just pregnant							.3192	3.93
moving house							.0411	0.89
improved finances							.5446	5.47
promoted at work							-.0497	0.88
birth of child							.2479	2.09
just retired							.7762	5.49
constant	7.5938	451.84	8.6336	232.26	7.2077	102.42	7.2998	102.49
R ²	0.01		0.03		0.17		0.19	

Table 9: The determinants of Life Satisfaction for Australians; Fixed-effect regression results for individuals in the balanced HILDA panels 2 to 6; N = 55,177

Variable:	Age		Age + Age ²		+ Demographics		+ Life Events	
	coefficient	t-value	coefficient	t-value	coefficient	t-value	coefficient	t-value
age	-.0233	7.16	-.0488	5.30	-.0501	5.09	-.0450	4.55
age*age			.0003	2.96	.0004	4.18	.0004	3.63
ln (weekly household income)					.0115	3.13	.0094	2.58
pension Income					-.0001	1.45	-.0001	1.17
female								
education years					-.0310	2.01	-.0362	2.35
married					-.0501	1.06	-.1217	2.37
separated					-.6000	9.02	-.4815	6.96
never married					-.2228	5.68	-.1304	3.30
divorced					-.3025	4.36	-.2922	4.17
widowed					-.6463	7.19	-.6206	6.68
employed					-.0095	0.42	-.0027	0.12
unemployed					-.1840	5.30	-.1571	4.52
disability					-.0255	1.55	-.0182	1.11
health					.2479	25.84	.2394	24.99
health a year ago					.0890	10.36	.0844	9.81
spouse/child death							-.1721	2.45
death of a relative							-.0205	0.97
personal injury							-.0937	3.72
jailing of self							.0092	0.05
injury to a family member							-.0424	2.12
property crime victim							-.1507	4.59
victim of violence							-.2574	4.10
just separated							-.4554	9.98
just reconciled							-.0156	0.20
fired from job							.0276	0.55
worsening finances							-.6187	11.75
death of friend							.0366	1.29
friend jailed							.0138	0.15
just married							.2884	3.36
start new job							.0417	1.06
just pregnant							.2944	4.07
moving house							.2533	5.87
improved finances							.3299	3.74
promoted at work							.0497	0.728
birth of child							.3624	3.70
just retired							.0364	0.28
constant	7.5938	451.84	9.443	45.53	8.605	33.72	8.624	33.84
R ² (overall)	0.01		0.00		0.04		0.04	

Figure 2: Average stress level from positive and negative life events; Australians aged 15 to 84

