Trajectories of Life Satisfaction in 11 Longitudinal Samples: A Coordinated Integrative Data Analysis

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Introduction

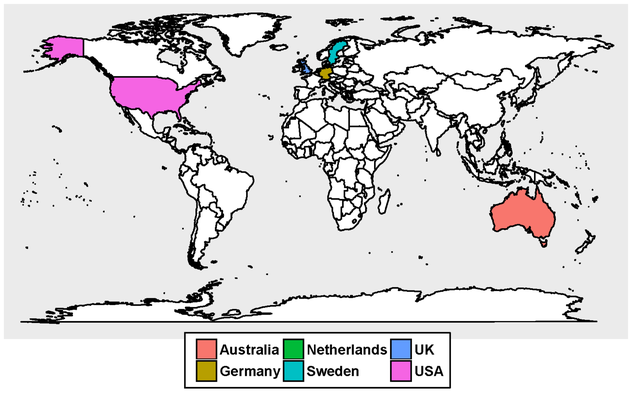
Life Satisfaction Trajectories

- Early cross-sectional research showed contradictory findings for the relationship between age and life satisfaction (LS). Some studies showed stability while others showed a positive correlation and negative correlations with age (Diener, & Suh, 1998 ; Prenda, & Lachman, 2001;Freund, & Baltes, 1998).
- Later cross-sectional work suggested Life Satisfaction follows a U-shaped curve, with its lowest point in midlife (~47yrs) and increasing into later life (~70yrs) (Blanchflower, & Oswald, 2008).
- Longitudinal work has shown both increases and stability in LS through middle age with declines in late life. Other studies, however, show declines in to early adulthood, followed by an increase into late adulthood before dropping off in late-life (mid-70s) (Mroczek, & Spiro, 2005; Baird, Lucas, & Donellan, 2010).
- Cross sectional studies confound age-related change with cohort differences, while longitudinal work may be conflated by instrumentation effects resulting from repeated measures and socio-historical contextual influences.

Methods

Coordinated Analysis and Reproducibility

- A coordinated analysis is a form on Integrative Data Analysis (IDA) (Hofer & Piccinin, 2009). Analyses are carried out in each individual dataset, using identical models and code, yielding a comparable set of results.
- Unlike a Pooled Analysis IDA (Curran & Hussong, 2009; example: Jokela et al., 2013), a Coordinated Analysis **allows differences** over measures, samples, and study designs.
- External validity requires similar results over different measures, samples, times, contexts, historical periods, etc. (Brunswik, 1956; Campbell & Stanley, 1966; Cook & Campbell, 1975; Hultsch & Hickey, 1977).



Acronym	Study	Origin	Sample N	Life Satisfaction Measure	Life Satisfaction Range	Follow-up Age Mean	Follow-up Age Range	n Waves
ALSA	Australian Longitudinal Study of Ageing	Australia	2062	1 item	0.9 - 4.3	80	65 - 106	4
DEAS	German Ageing Study	Germany	16667	SWLS	1 - 5	63	40 - 95	5
GSOEP	German Socio-Economic Panel		78747	1-item	0 - 10	46	14 - 105	32
LASA	Longitudinal Aging Study Amsterdam	Netherlands	3683	2-item	1 - 5	71	55 - 101	7
OCTO	Origins of Variance in the Oldest-Old: Octogenarian Twins	Sweden	487	LSI-Z	1 - 4.2	85	79 - 98	4
SATSA	Swedish Adoption/Twin Study of Aging		2173	LSI-Z	1 - 5	64	26 - 103	7
ELSA	English Longitudinal Study of Ageing	UK	14845	SWLS	1 - 7	66	17 - 99	6
BPHS	British Household Panel Study		26641	1-item	1 - 7	45	15 - 100	12
HRS	Health and Retirement Study	USA	21150	SWLS	1 - 7	68	18 - 104	5
MIDUS	Midlife in the United States National Survey		6455	5-Item	0 - 10	53	20 - 93	3
NAS	Veterans Affairs - Normative Aging Study		972	LSI-A	0 - 1	70	45 - 91	11
			1527	SWLS	1 - 7	75	57 - 91	6
		Total N = 175409			Average	66	38 - 99	9

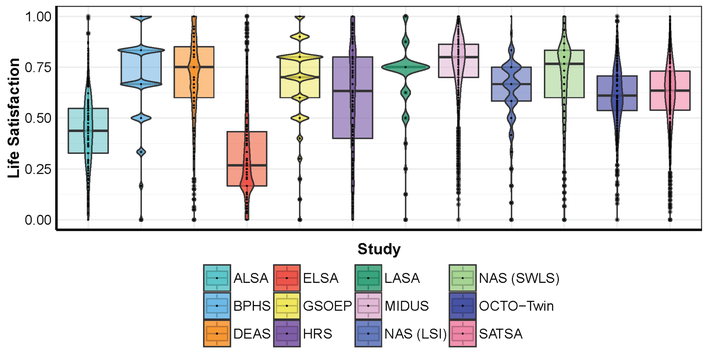
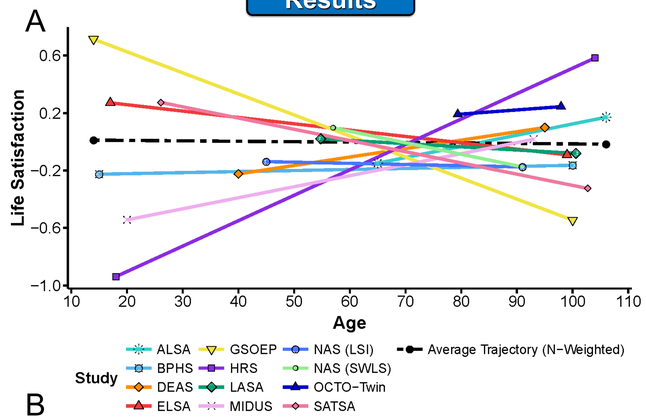
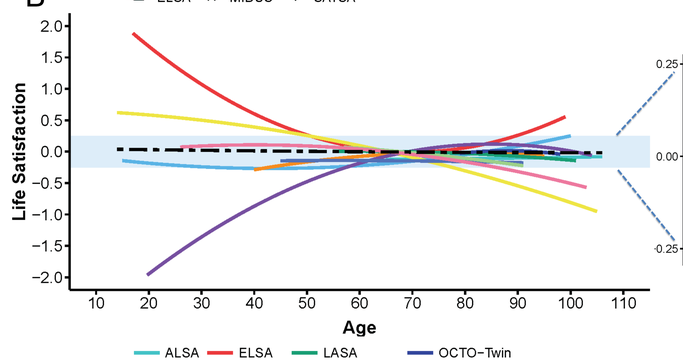


Figure 1. Box plot and Violin Plot depicting the Distribution of Life Satisfaction Scores Across Studies. *Note. All scores were rescaled to have a range between 0 and 1.*

Results





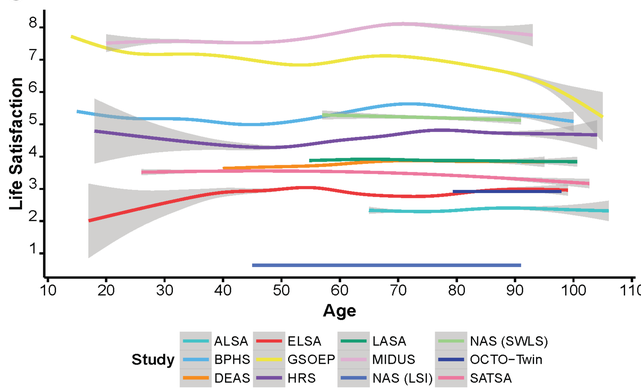


Figure 2.
A) Multi-Level Model Linear Growth Curve Trajectories.
B) Multi-Level Model Quadratic Growth Curve Trajectories
Note. Fixed Effects Estimates are C-Score Standardized at age 80 across studies for graphing purposes only.
C) Generalized Additive Model (GAM) with Integrated Smoothing across all waves of data, not accounting for nested structure. 95% confidence band intervals are shown.

Data Analyses

All analyses used trajectory modeling within a multilevel model framework (Raudenbush & Bryk, 2002, Singer & Willet, 2003, Singer, 1998). Individual growth modeling estimates both within-person and between-person differences in trajectories.

1) How a person varies over time
2) How individuals vary from one another

Two levels of models are employed to make these estimations simultaneously.

Linear Growth Curve Model

Level 1 (Within):

$LS_{ti} = \pi_{0i} + \pi_{1i}(AGE_{ti} - 68) + \varepsilon_{ti}$

Level 2 (Between):

$\pi_{01} = \beta_{00} + r_{0i}$

$\pi_{11} = \beta_{10} + r_{1i}$

Quadratic Growth Curve Model

Level 1 (Within):

$LS_{ti} = \pi_{0i} + \pi_{1i}(AGE_{ti} - 68) + \pi_{2i}(AGE_{ti} - 68)^2 + e_{ti}$

Level 2 (Between):

$\pi_{01} = \beta_{00} + r_{0i}$

$\pi_{11} = \beta_{10} + r_{1i}$

$\pi_{21} = \beta_{20}$

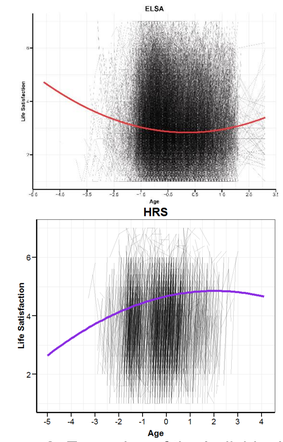


Figure 3. Examples of the Individual Trajectories of Life Satisfaction used for Estimation of the Overall Fixed Effect of Age

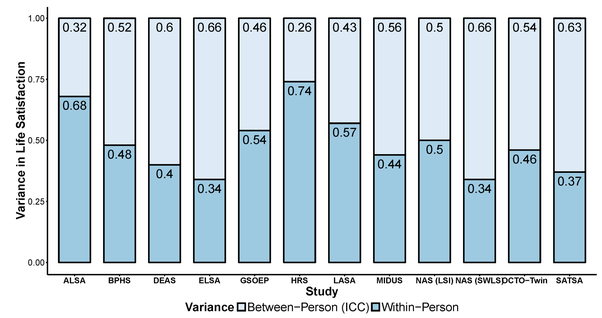


Figure 4. Intra-Class Correlation Coefficients: Proportion of Variance in Life Satisfaction due to Between-Person versus Within-Person Differences Across Studies.

Conclusions

- Considerable variability in trajectories of Life Satisfaction exists across studies
- 6 of the studies showed a significant quadratic effect designated by U-shaped trajectories (BPHS, ELSA, GSOEP) and inverted U-shaped curves (DEAS, HRS, SATSA).
- The majority of studies show decline in Life Satisfaction in late-life with the exception of ALSA, BPHS, ELSA.
- Preliminary cross-sectional investigations show minor fluctuations in LS in the form of peaks and valleys across the lifespan. Perhaps LS is better specified by a more complex higher-order trajectory.
- Proportion of variance in Life Satisfaction due to between-person and within person varies widely across studies

Future Directions

- Parse out instrumentation, cohort, and contextual effects within studies by comparing cross-sectional and longitudinal analyses (Baird, Lucas, Donellan, 2010)
- Assess Factorial Invariance across measurement occasions
- Model higher order polynomial trajectories of LS in studies with sufficient measurement occasions
- Utilize alternative Time-Metrics (Time-in-Study, Time-to-Death) and comparing results
- Investigate sources of study-level variation accounting for heterogeneity in the effect sizes.
  - (Measure-related, Country-level, Sample-composition)
- Investigate sources of individual-level variation accounting for heterogeneity in slopes across individuals.
- Slopes as predictors of health outcomes and mortality risk

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