

Concept Paper Form

Provisional Paper Title: Stressful life events, personality, and health from childhood to midlife
Proposing Author: Kyle Bourassa
Author's Email: kyle.bourassa@duke.edu
P.I. Sponsor: Terrie Moffitt and Avshalom Caspi
Today's Date: 2/26/2020

Objective of the study:

The experiences of stress and stressful life events are associated with poorer health. This includes both adverse events in childhood¹⁻², as well as the experience of stressful life events in adulthood³⁻⁴. Although a large body of literature has linked stressful life events across the lifespan (particularly early adversity) to poorer health, far fewer studies have taken a lifespan approach and compared the association of stressful life events during different development periods in an integrated model³. It is important to extend the study of these associations into midlife and later adulthood, when the health consequences related to chronic disease are occurring. It is possible, for example, that early life adversity drives changes in later physical health, or that both adversity in childhood and adulthood have independent cumulative effects on health.

Furthermore, it is likely that different people react differently to the same stressors. In trying to understand the health consequences of stressful life events, it is important to characterize the people whose individual-difference characteristics make them more or less at risk for poorer health in response to stressful events. Personality is one promising avenue to investigate, as measures of stress reactivity (i.e., neuroticism) have been linked to poorer health and emotional difficulty following stressful events⁴⁻⁶. It is possible that people high in stress reactivity are at greater risk of poor health if they experience more stressful life events across the life span. Similarly, there is some evidence that childhood adversity, in the form of trauma, can increase later stress reactivity⁷. It is possible that childhood stressors could predict changes in stress reactivity during adulthood.

The question remains whether the experience of stressful life events at different ages is differentially associated with later health based on individual differences in stress reactivity. The Dunedin Study is well-suited to address this question, as it includes stressful life circumstances assessed in both childhood and adulthood, measures of stress reactivity assessed in both childhood and adulthood, and several outcome measures of physical health at midlife (e.g., self-rated health, McClintock Comprehensive Health Index⁸). The current proposal seeks to examine the association of stressful life events and health, as well as the role that personality might play in this association, from childhood to midlife.

Data analysis methods:

In pursuit of these aims, we propose the following analyses:

Aim 1: Investigate the association of stressful life events across the lifespan with physical health outcomes at age 45. These models will include both direct associations of early adversity and stressful life events in adulthood with health, as well as the interaction of early adversity and adult stressful life events. Health outcomes will include the McClintock Comprehensive Health Index, self-reported physical health, and informant-reported health at 45. We predict that stressful life events in both childhood and adulthood will independently predict poorer health at age 45, and that stressful life events in childhood will moderate the association of adult stressful life events and health, such that there will be a stronger association between stressful life events in adulthood and health for people who experienced more stressful life events in adulthood.

Aim 2: Extend model outlined in Aim 1 to also include measures of personality (in the form of stress reactivity) from childhood to adulthood. We will examine the whether stressful life events in childhood predict increases in stress reactivity from childhood to adulthood. We predict that more ACEs in childhood will predict an increase in rank order on stress reactivity measures from childhood to adulthood.

Aim 3: Extend the model from Aims 1 and 2 to include the interaction of stressful life events and personality (in the form of stress reactivity) predicting health at age 45. The model will include the main effects of stress reactivity and stressful life events in childhood and adulthood on later health outcomes. The model will also test (1) whether childhood stress reactivity moderates the association of stressful life events in childhood and later health, and (2) whether stress reactivity in adulthood moderates the association of adult stressful life events and later health. We predict the association of stressful life events and physical health will be stronger in people with higher levels of stress reactivity in both childhood and adulthood. Figure 1 outlines the conceptual model guiding these three aims

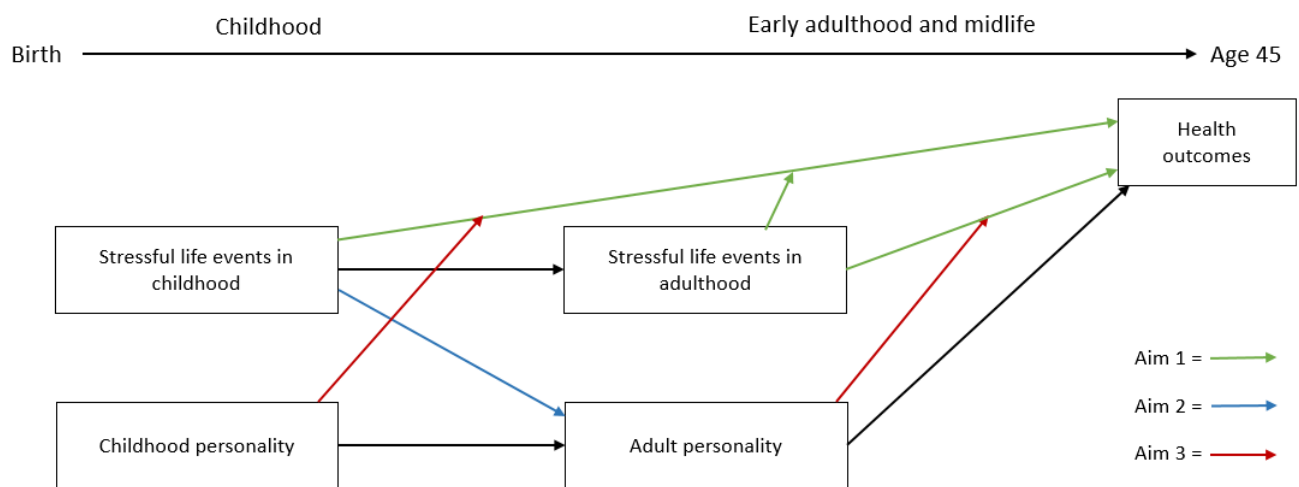


Figure 1. Conceptual model guiding hypotheses. Final path model will depend on the overall pattern of associations and appropriate decisions for model specification.

General analysis methods: The models will use path analysis structural equation modeling. All models will be run in MPLUS⁹ using full information maximum likelihood estimation to account for missing data¹⁰.

Variables needed at which ages:

- Physical health

- McClintock Comprehensive Health Index at 45
- Self-reported physical health at 45
- Informant-rated health at 45
- Assessor-rated health at 45
- Childhood health composite
- Stressful life events
 - Adult events assessed at 38 and 45 (measuring events from age 33 to 45) using count of events reported in the life history calendar interview
 - Childhood prospective ACEs
- Personality characteristics
 - Stress reactivity scale from the MPQ at 18 and 26
 - Informant-rated neuroticism scale at 26 and 32
 - Rutter worry/fearful scale from ages 5 to 11
- Demographic and health covariates
 - Sex

Significance of the Study (for theory, research methods or clinical practice):

Disentangling the time course in the associations between stressful life events, personality, and health is essential to support future prevention efforts. For example, if more proximal stressful life events are more predictive of health in adulthood, then prevention efforts could target these events, rather than experiences in childhood—and vice versa if events in childhood appear to be more predictive. In addition, assessing personality factors will allow for a better effort to disentangle the question of whether stressful life events predict poorer health independent of people’s emotional reactivity, if stress-reactive people encounter more stressful life events, or if certain people are at greater risk for poorer health following stressful life events than others.

References:

1. Chartier MJ, Walker JR, Naimark B. Separate and cumulative effects of adverse childhood experiences in predicting adult health and health care utilization. *Child Abuse Negl*, 2010;34(6):454-64.
2. Kalmakis, K.A. and Chandler, G.E. Health consequences of adverse childhood experiences: a systematic review. *J Am Assoc Nurse Pract*, 2015;27(8):457-465.
3. Farrell AK, Simpson JA, Carlson EA, Englund MM, Sung S. The impact of stress at different life stages on physical health and the buffering effects of maternal sensitivity. *Health Psychol*, 2017;36(1):35.
4. Horn M, Mellers M, Almeida DM, Neupert SD. Women's daily physical health symptoms and stressful experiences across adulthood. *Psychol Health*, 2005;20(3):389-403
5. Ogle CM, Rubin DC, Siegler IC. Changes in neuroticism following trauma exposure. *J Pers*. 2014;82(2):93-102.
6. Lahey BB. Public health significance of neuroticism. *Am Psychol*. 2009;64(4):241.
7. Breslau N, Schultz L. Neuroticism and post-traumatic stress disorder: a prospective investigation. *Psychol Med*. 2013 Aug;43(8):1697-702.
8. Schneider TR. The role of neuroticism on psychological and physiological stress responses. *J Exp Soc Psychol*. 2004 Nov 1;40(6):795-804.
9. McClintock MK, Dale W, Laumann EO, Waite L. Empirical redefinition of comprehensive health and well-being in the older adults of the United States. *PNAS*, 2016;113(22):E3071-80.
10. Muthén LK. & Muthén BO. Mplus User's Guide. Seventh Edition. Los Angeles, CA: Muthén & Muthén. 1998-2012.
11. Graham JW. Missing data analysis: Making it work in the real world. *Annu Rev Psychol*. 2009;60, 549-576.

Data Security Agreement

Provisional Paper Title: Stressful life events, personality, and health from childhood to midlife
Proposing Author: Kyle Bourassa
Today's Date: 2/26/2020

<input checked="" type="checkbox"/>	I am current on Human Subjects Training (CITI (www.citiprogram.org) or equivalent)
<input checked="" type="checkbox"/>	My project is covered by the Duke ethics committee OR I have /will obtain ethical approval from my home institution.
<input checked="" type="checkbox"/>	I will treat all data as "restricted" and store in a secure fashion. My computer or laptop is: a) encrypted (recommended programs are FileVault2 for Macs, and Bitlocker for Windows machines) b) password-protected c) configured to lock-out after 15 minutes of inactivity AND d) has an antivirus client installed as well as being patched regularly.
<input checked="" type="checkbox"/>	I will not "sync" the data to a mobile device.
<input checked="" type="checkbox"/>	In the event that my laptop with data on it is lost, stolen or hacked, I will immediately contact Moffitt or Caspi.
<input checked="" type="checkbox"/>	I will not share the data with anyone, including my students or other collaborators not specifically listed on this concept paper.
<input checked="" type="checkbox"/>	I will not post data online or submit the data file to a journal for them to post. <i>Some journals are now requesting the data file as part of the manuscript submission process. Study participants have not given informed consent for unrestricted open access, so we have a managed-access process. Speak to Temi or Avshalom for strategies for achieving compliance with data-sharing policies of journals.</i>
<input checked="" type="checkbox"/>	I will delete all data files from my computer after the project is complete. Collaborators and trainees may not take a data file away from the office. This data remains the property of the Study and cannot be used for further analyses without an approved concept paper for new analyses.

Signature: 