Concept Paper

Provisional Paper Title: The Impact of Romantic Relationship Characteristics on Pace of Aging During Midlife

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Objective of the study:

The presence or absence of social relationships—and particularly romantic relationships—has consistently been associated with physical health outcomes[1-3]. For example, meta-analyses have shown that those who are divorced are at higher risk of early death compared to people who remain married using total samples in the millions[2-3]. Higher romantic relationship quality and more intimate partner violence (IPV) have each been linked to poorer health[4-5], suggesting that it is not only the presence or lack of a relationship that may impact health, but the specific characteristics of those relationships as well.

There is a wealth of research examining the link between romantic relationships and health[6-7], though the majority of this work has focused on clinical endpoints, such as all-cause mortality[1-3,8], that are difficult to assess until later life. Relatively less research has examined biological intermediaries during adulthood when these relationships are becoming entrenched as a part of people's social support system. There is a clear need to examine whether the link between romantic relationship characteristics and physical health is evident across adulthood when the impacts of social relationships on health may first be occurring.

A wide array of measures and methods can be used to assess physical health across the systems of the human body, including the circulatory, endocrine, and endothelial systems, among others. Individual measures assessing distinct aspects of single systems, however, can present issues with reliability that broader composites of physical health better protect against. The pace of aging[9] provides a validated, reliable, and relevant physical health outcome variable that shows variation in midlife and would allow us to test whether romantic relationship characteristics are predicting changes in physical health over time.

The current study seeks to examine the longitudinal association between romantic relationship quality and status with the pace of aging. The aims will be twofold. First, do people in romantic, cohabitating relationships have a slower pace of aging than those who are not? Second, among those people in romantic relationship, do relationship characteristics (e.g., relationship quality, IPV) predict the pace of aging?

Data analysis methods:

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

Aim 1: Does romantic relationship status predict the pace of aging?

We will create a variable characterizing participants as either (0) not in a relationship or casually dating without an involved partner or (1) in a current non cohabitating romantic relationship, currently in a cohabitating relationship, or married. This status will be assessed at Phases 26, 32, 38, and 45 and summed to characterize the sample participants' relationship status "dosage" over time. We will use this variable to predict the pace of aging in the Dunedin sample among those who participated in at least 50% of phases

from 26 to 45. One aim of this analysis is to ascertain whether SM's who have not been in a partnered relationship have faster pace of aging (as might be suggested by the literature on social isolation and midlife health). If social isolation predicts faster pace of aging, then we will need to take this into account when we test whether IPV predicts faster pace of aging, because some SM's will have zero IPV scores because they never had a relationship.

Aim 2: Do romantic relationship characteristics predict the pace of aging?

We will create variables representing average relationship quality and the amount of IPV reported in participants' relationships across phases. IPV will be assessed using a mean score of the IPV scale items summed across phases. We will then create an average relationship quality variable by averaging relationship quality across phases. We will use this variable to predict the pace of aging in the Dunedin sample among those who reported on IPV and relationship quality at a minimum of 50% of phases from 26 to 45, first in independent models, then in a single model. As a secondary analysis, we will test whether a two-way interaction of relationship quality and IPV predicts pace of aging.

Sensitivity analyses:

We will also test whether any results found for relationship quality and IPV replicate when only using people in romantic relationships of 20 years or more (*n* = 282) to assess whether these results are stable in people who have been in the same relationship across all phases. We will also test whether there are differences between different categories of IPV (See description of the IPV variables for more details).

General analysis methods:

The primary outcome used in the study will be pace of aging; facial age at phase 45 will be a secondary outcome. All models will include a variety of relevant demographic, childhood, and health behavior covariates, including gender, duration of longest relationship (when relevant), relationship "dosage" (when relevant), number of relationships (when relevant), smoking (pack years), adverse childhood experiences, childhood health, and childhood SES. Participants with less than 50% of relevant data will be excluded, and missing data for composites will use mean score replacement. All models will be run in MPLUS[10] using full information maximum likelihood estimation to account for missing data in cases where those participants were not excluded due to reasons provided above[11].

<u>Variables needed at which phases:</u>

- Relationship status
    - At phase 26, 32, 38, and 45, scored on a binary scale and summed
- Relationship quality
    - At phase 26, 32, 38, and 45, averaged across phases using the 9-point scale from phase 45
- Intimate partner violence
    - At phase 26, 32, 38, and 45, averaged across all phases first, then within the eight methods of assessing (binary vs scale, perpetration vs victimization, psychological vs physical)
    - Will also create a sum score for dosage using binary score (e.g., 0-4, 1 point for each category of IPV per phase) that is then summed across occasions.
- Pace of aging from phase 26 to 45
- Facial age at phase 45
- Romantic relationship separations from phase 26 to 45, summed
- Length of relationship at phase 45
- Longest relationship reported between phase 26 and 45

- Demographic covariates
    - Gender
- Health behavior covariates
    - Pack years
- Childhood covariates
    - Prospective ACEs
    - Childhood health
    - Childhood SES

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

This study seeks to link romantic relationships characteristics and physical health outcomes in a time period (26-45 years old) that is critically understudied in are of social relationships and health. The use of a validated composite measure of physical health in midlife—the pace of aging—will enable us to effectively asses the longitudinal association of romantic relationship characteristics with physical health, presenting new information about when health changes linked to social relationships occur, in order to support future prevention and intervention efforts.

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Data Security Agreement

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KB	I will not "sync" the data to a mobile device.
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KB	I will not post data online or submit the data file to a journal for them to post. *Some journals are now requesting the data file as part of the manuscript submission process. The Dunedin Study Members have not given informed consent for unrestricted open access, so we have a managed-access process. Speak to Terrie or Avshalom for strategies for achieving compliance with data-sharing policies of journals.*
KB	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. The data remains the property of the Study and cannot be used for further analyses without an approved concept paper for new analyses.

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