

Does early life pathogen exposure modify the link between psychosocial stress and telomere length in the Philippines?

Robert L. Tennyson
Department of Anthropology

Problem

- Psychosocial stressors predict negative health outcomes, but the mechanisms are not fully known
- One pathway may be that stress accelerates the shortening of telomere length (TL)
- Telomeres are DNA sequences that 'cap' chromosomes and shorten with cell replication and age – this shortening negatively impacts cellular and bodily health
- The hypothesis that stress shortens TL has mixed support in high-income populations
- However, *we have failed to find an association between stress and TL in the Philippines*

Proposed Solution

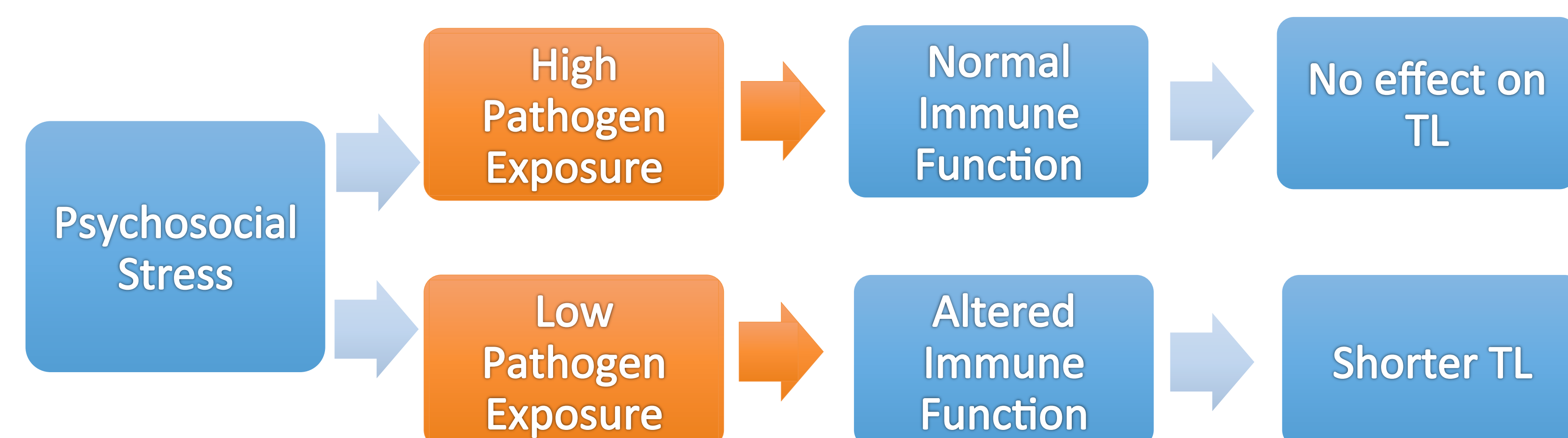
- Stress may affect TL through its impacts on immune function and inflammation
- The *Hygiene Hypothesis* postulates that immune function becomes oversensitive in low pathogen environments. This sensitivity may allow non-immunological challenges, such as stress, to impact immune function
- A recent study demonstrated that pathogenic environments in early life in the Philippines decrease the association between stress and inflammation
- Therefore, we hypothesize that *pathogenic environments in early life moderate the association between stress and TL*

Acknowledgements: This project is mentored by Dr. Dan Eisenberg and includes several co-authors: LT Gettler, CW Kuzawa, MG Hayes, S Agustin. The sample collection and extractions were supported by NSF and Wenner Gren Foundation grants. DNA extracts were generously provided by Karen Mohlke.

Methodology

- Cebu Longitudinal Health and Nutrition Survey (n = 1,147, age = 21.7 (20.8, 22.5))
- Blood TL measured by qPCR
- Multiple Regression with TL as dependent variable, including control variables, Psychosocial Stressors, Pathogen Exposure, and pairwise interactions between stressors and pathogens
- Wald Test to address multiple testing issues and combine significance of variables

Hypothesized Pathway Connecting Stress to TL



Measures

- Control variables:
 - Age
 - Sex
 - Age*Sex
 - BMI
 - Smoking status
 - Urbanicity
 - Principle Components of genome-wide SNP data
- Psychosocial Stressors:
 - Parental instability
 - Sibling loss
 - Average lifetime Household income
 - Perceived stress
 - Depressive symptoms
 - Physical violence
 - Psychological violence
 - Intimate partner violence
- Pathogen Exposure (early life):
 - Exposure to animal feces
 - Infectious symptoms
 - Season of birth
- All pairwise interactions between Stress and Pathogenicity

