The Link Between Environment, Age, and Health in a Large Cohort of Companion Dogs from the Dog Aging Project

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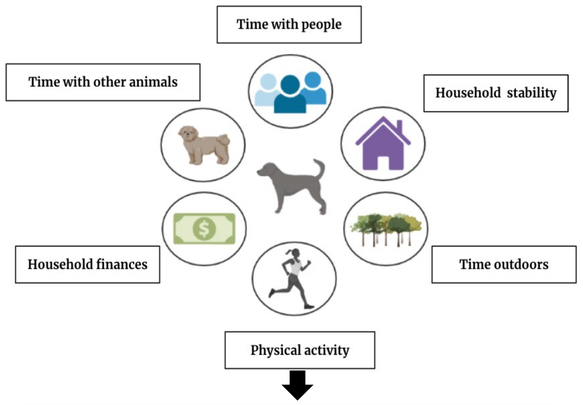
Introduction

- Measures of **social status, social integration, and early-life adversity** are among the strongest and most consistent predictors of health and survival outcomes[1].
- However, little is known about if and how these health and mortality effects vary across lifespan.
- We are leveraging the use of the companion dog because they age similarly to humans, are genetically and phenotypically diverse, and they share human environments[2].



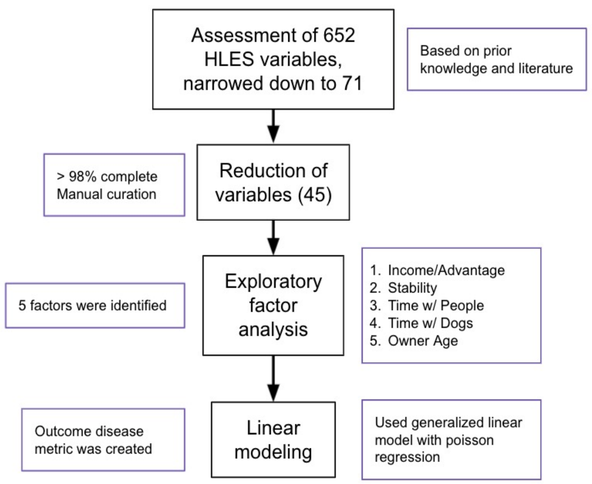
- **General Health**: owner reported measure of health (scale 1-6)
- **Disease Instances**: cumulative number of diseases reported by owner

Objectives

- Quantify primary axes of the social environment(SE).
- Identify which components **most strongly** affect health?
- Understand how these effects change with age.

Methods

Data analysis pipeline : Variables were selected from the Health and Life Experiences survey (HLES) owners completed as member of The Dog Aging project (dogagingproject.org)



Results

Figure 1. Demographics of the Dog Aging Project

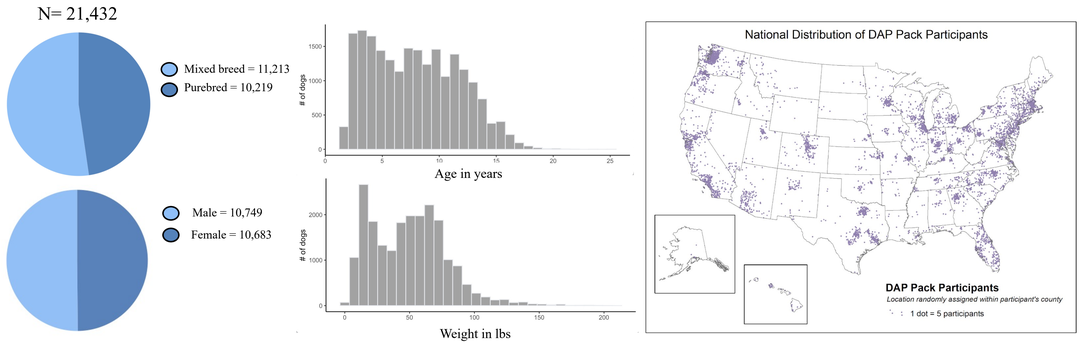
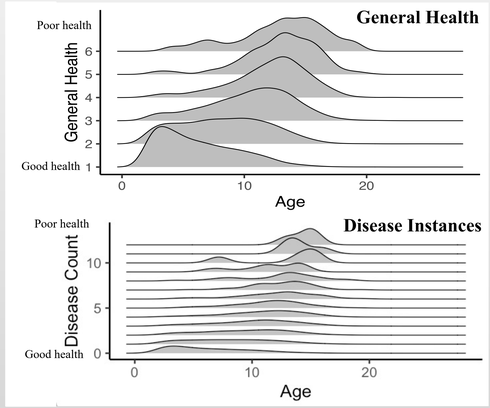
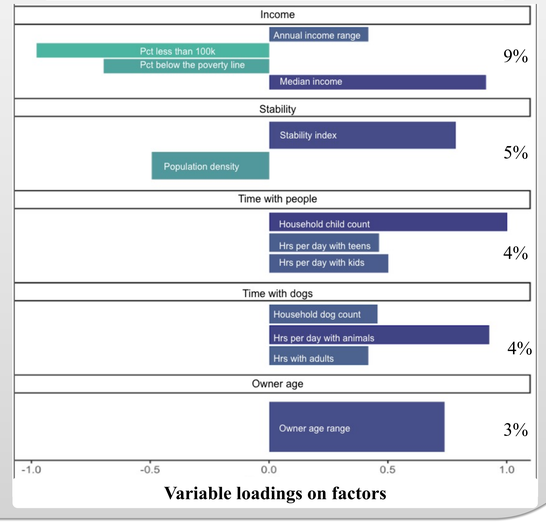
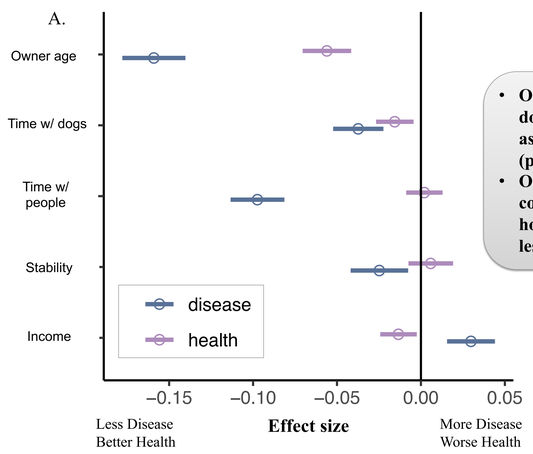


Figure 2. Age is strongly associated with general health and disease in the DAP cohort



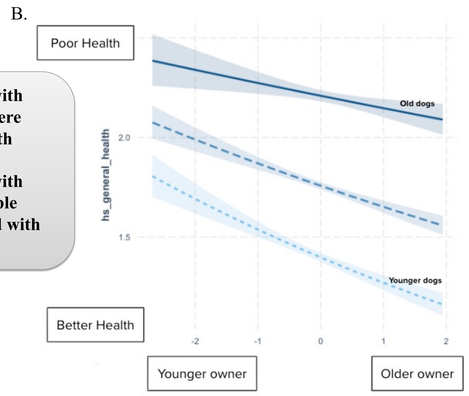
Environmental factors





Generalized linear model with Poisson link. Models controlled for dog age and weight

- **Older owners, more time with dogs, and higher income were associated with better health (purple).**
- **Older owners, more time with companions, and more stable households were associated with less disease (blue).**



3B. Young dogs are more sensitive to the health effects of having a young vs. old owner.

Conclusions & Future Directions

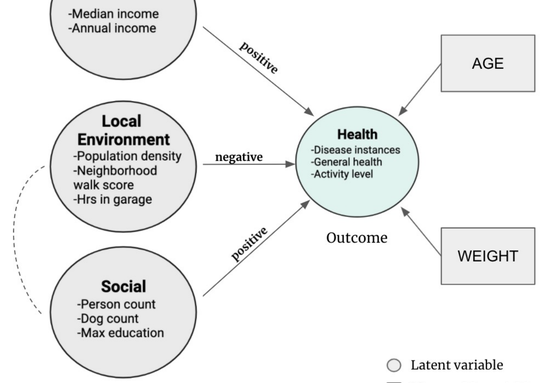
Conclusions

- We generated the first characterization of a companion dogs' social environment.
- Higher income, older owners, and more time with other dogs were associated with better overall general health.
- Older owners, more time with people, more time with dogs, and more stable households were associated with less disease.
- Interestingly, in the disease model, higher income was associated with more disease instances.

Future Directions

- Better understand the relationship between owner age and general health
- Introduce potential modifiers like exercise/ activity level
- Investigate the relationship between income level and disease using metrics like veterinary care visit frequency.
- Use a multivariate modeling method called structural equation modeling (SEM) to understand the SE as a natural system.

Figure 4. Structural equation meta-model of the social environment as a system and the relationship between each component and health



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