Investigating Child Feeding In A Virtual Reality Buffet

Field Experience Presentation

Corey Miller

Friday, November 10th, 2017

Presentation Agenda

- Field experience location
- Agency background information
- Preceptor background
- Field experience objectives
- Research projects
- Finished capstone project
- Core competencies

Field Experience

- National Institutes of Health
- Dr. Susan J. Persky, PhD
  - June 5th, 2017 through August 11th, 2017

U.S. Dept. of Health & Human Services

Mission:

To enhance and protect the health and well being of all Americans.

- Effective health and human services
- Medicine, Public health, Social sciences

11 Operating Divisions

- Administration for Children and Families (ACF)
- Administration for Community Living (ACL)
- Agency for Healthcare Research and Quality (AHRQ)
- Agency for Toxic Substances and Disease Registry (ATSDR)
- Centers for Disease Control and Prevention (CDC)
- Centers for Medicare & Medicaid Services (CMS)
- Food and Drug Administration (FDA)
- Health Resources and Services Administration (HRSA)
- Indian Health Service (IHS)
- National Institutes of Health (NIH)**
- Substance Abuse and Mental Health Services Administration (SAMHSA)

National Institutes of Health

- Primary resource for biomedical & public health research

Main campus: Bethesda MD
- 20,000 employees

Other:
Baltimore, MD
Frederick, MD
Research Triangle, NC
Hamilton, MT
Phoenix, AZ

National Institutes of Health

Mission:

Seek fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to enhance health, lengthen life, and reduce illness and disability.

27 NIH Institutes and Centers

National Human Genome Research Institute

Mission:

To encompass a broad range of studies aimed at understanding the structure and function of the human genome and its role in health and disease.

National
Human Genome
Research Institute

9 NHGRI Branches

- Cancer Genetics & Comparative Genomics Branch (CGCGB)
- Computational & Statistical Genomics Branch (CSGB)
- Genetics Disease Research Branch (CSGB)
- Genetics & Molecular Biology Branch (GMBB)
- Medical Genetics Branch (MGB)
- Medical Genomics & Metabolic Genetics Branch (MGMGB)
- Metabolic, Cardiovascular & Inflammatory Disease Genomics Branch (MCIDGB)
- Translational & Functional Genomics Branch (TFGB)
- Social & Behavioral Research Branch (SBRB)**

Social & Behavioral Research Branch

- Applying new genomic discovery to improve health & clinical care
- Translates genomic discoveries into interventions that improve health-related decisions and outcomes, and investigates the social, ethical and public policy impact of genomic research

Dr. Susan J. Persky, PhD

- Senior Investigator
- Head of the Immersive Virtual Testing Area (IVETA)

Her work:

- Virtual reality-based healthcare simulations to investigate how information about genomic discoveries related to common conditions influence outcomes.

Other interest:

- New genomic information might influence social stigma, health disparities & other forms of unequal treatment.
- Examines the context and ways in which genomic information is disseminated

Learning Objectives

1. Describe the body of work, including that taking place in SBRB, linking genetics, nutrition oriented behavior & psych factors.

2. Discuss simulation approaches to measuring food intake.

3. Implement coding systems to transform observed dietary behavior into quantitative variables.

Research Projects

- ParentsTAKE
- Diabetes
- New Technology & Child Health (nTech)

Parents TAKE

Purpose:

To assess the influence of information about children's obesity risk on parental feeding behavior, beliefs & attitudes

Objectives

Primary:

What is the influence of information on children's obesity risk on parent feeding behavior?

Secondary:

Discover the mechanisms that explain the influence of information regarding children's obesity risk on parental feeding behavior.

Exploratory:

Understand user behavior in the virtual reality buffet, along with gender differences in behavior.

Duties

- Literature reviews/Ref Searches

- Redesign study materials

Lit Review Topics

- Identifying gender differences in specific eating behavior traits
  - Disinhibition, pickiness, food neophobia, binge eating
- Investigating if parents feed boys more than girls
- Identifying if parents have a sense of whether they are feeding high or low-calorie meals to their kids

Lit Review Topics cont.

- Investigating if fathers are under-represented in the child feeding literature
- Identifying if kids would eat less if parents put less food on their plates
- Identifying methods and papers in which parent feeding of a child was measured in a variety of ways

Study Materials

Task:

- Public health oriented educational materials
  - Obesity risks, family environment, genetics
- List of web-based sources for parents regarding information on children's health
  - Nutrition, physical activity, sleep
- Building blocks for healthier life for children

Nutrition

- Protein
- Carbohydrates
  - Fiber
- Fats
- Calcium
- Vitamin D
- Iron
- Vitamin A

Physical Activity

- healthy growth
- leaner body
- less likely to become overweight

- better concentration
- better outlook on life

- decreased risk of disease
- increased ability to fight sickness

Sleep

- Sleep is important to kids' well-being
- Most children spend 40 percent of their day asleep

- Sleep directly impacts mental and physical development
- Children aged 1-12 years should get 9-12 hours of sleep per day

Raising Healthy Kids Module

NIH National Human Genome Research Institute

Raising Healthy Kids

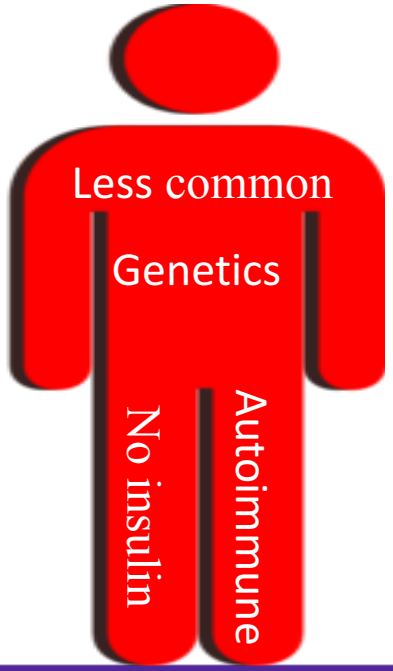
Data Coding & Management

- Data must be analyzed
- Working with original data can be complicated
- Minimizes potential errors
  - Improves worker efficiency
- Data coding makes the researchers job easier!
- Codebook provides an ordered guide for identifying values associated with a coding response given for a specific survey question.

Diabetes

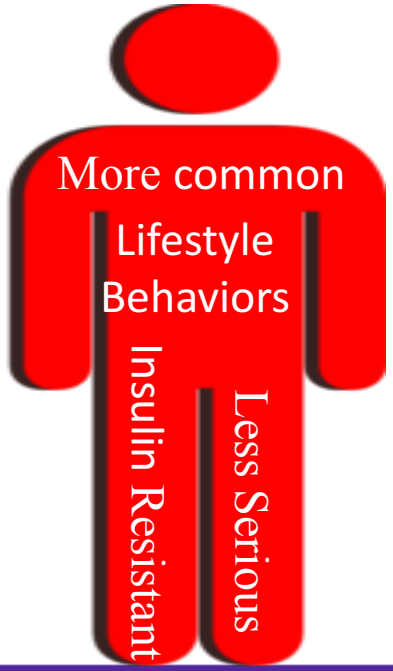
Type 1

- Pancreas produces little or no insulin
- Early onset
- Believed to be more genetic in origin



Type 2

- Body resists insulin or doesn't produce enough
- Later onset
- Attributed to lifestyle behaviors

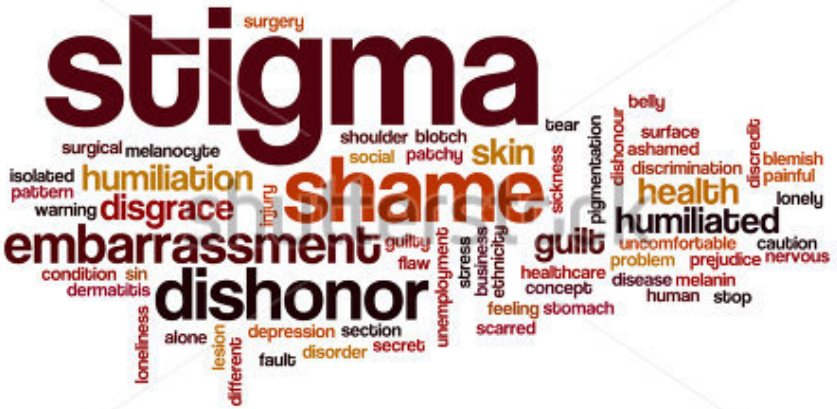


Diabetes Stigma

Over the years, advocacy groups & scientist have communicated the need for diabetes-related stigma research.

- Qualitative

- Health-related stigma is highly associated with poorer health outcomes



Diabetes Stigma Background Info

- Research focused on health outcomes associated with causal understanding, stigma and self-concept

- Anonymous questionnaires to patients with type 1 & 2 diabetes
  - Sample of healthy controls through online surveys to help researchers understand how people think & feel about issues related to diabetes

Diabetes Stigma Background Info

- Participants in all groups completed questions assessing general perceptions, quality of life, health status and demographics

- Patients with type 1 or type 2 diabetes completed an additional questionnaire related to disease management, diabetes symptoms, disease perceptions and disease-related self-concept.

- Incentivized via amazon gift cards

Duties

Coded 3 specific questions:

1. What is type 1 diabetes?

2. What is type 2 diabetes?

3. What is the difference between type 1 & type 2 diabetes?

2-Point Coding Scheme

Coding Scheme Dimensions			
• Age of onset	• Pathophysiology	• Causal factors	• Severity
• Outcome	• Prevalence	• Treatment	• Controllability

"Type 1 involves the body to make insulin properly, w it still can produce insulin, can't absorb it from the bl unavoidable, but Type 2 ca prevented or mitigated thr changes. Type 1 also usual during childhood or the te Type 2 usually shows up la

"Type 1 is non curable a is curable."

"You grow out of type 1 and type 2 you have to live with forever."

Good Understanding	Satisfactory Understanding	Poor Understanding
≥ 2 with no mistakes	1 and/or minor mistakes	0 / major mistakes

New Technology & Child Health (nTech)

Evaluated & tested new behavioral science methods and measures using virtual reality tools in the IVETA research facility for future research projects.

- IVETA had recently acquired a tool that is designed to assess participant emotional state based on automated, computer-based coding of facial expressions.
  - Test its feasibility, efficacy and validity in social and behavioral health research.

- Multiple research questions were tested in regards to the influence of emotion and health communication information framing on food choices made for one's child.

Capstone Project

- Investigating child feeding in a virtual reality buffet and the influences that message framing has on parent emotion.

- Benefits of fruit & vegetable consumption
  - Disease prevention, reduce risk of chronic disease
  - Fruits & Veggies supplying vitamins & minerals
    - Provide antioxidants & anti inflammatory agents that fight off disease

- Importance is known but parents still aren't feeding nearly enough to kids

National Human Genome Research Institute

Investigating Child Feeding in a Virtual Reality Buffet-Influences of Message Framing and Parent Emotion

Corey Miller[1,2], Megan Goldring[2], Rachel Cohen[2], William Kistler[2], Sofia Bouhlal[3,4], Rebecca Ferrer[5], William Klein[5], Susan Persky[2]

[1]Kansas State University, [2]Social and Behavioral Research Branch , NHGRI, [3]NIAAA, [4]NIDA, [5]Behavioral Research Program, NCI

SBRB

Background

- Important to understand effective ways for communicating to parents about child nutrition, as well as contextual factors that influence parent responses to health messages
- Previous literature found that a gain frame was more effective in increasing fruit and vegetable consumption for those in an anger state and a loss frame more effective for those in a fear state[1]
- A lack of literature exists regarding the role of emotion and message framing in decision making for child-feeding
  - There is some speculation that these factors may have different influences[2]
- We examined this possibility within the nTech study which explored the role of these factors in genetic information seeking and child feeding

Objective

Determine whether emotion induced in participants (fear vs anger), crossed with language framing of a preventive health message (gain vs. loss frame) results in hypothesized effects consistent with previous research, and whether this differs for mothers vs. fathers.

Hypothesis

Elicited emotion and framing of the health message will interact such that participants will select more servings of fruit and vegetables from the buffet for their child when exposed to the following combinations: anger with gain frame, and fear with loss frame.

References

1. Gerend, M.A., & Maner, J.K. (2011). Fear, anger, fruits, and veggies: interactive effects of emotion and message framing on health behavior. Health Psychology, 30(4), 420.
2. O'Keefe, D.J., & Nan, X. (2012). The relative persuasiveness of gain-and loss-framed messages for promoting vaccination: A meta-analytic review. *Health communication*, 27(8), 776-783.
3. Lerner, J S., Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgment and choice. *Cognition & Emotion*,14,4: 473-493.
4. Ferrer, R., Klein, W., Lerner, J. S., Reyna, V. F., & Keltner, D. (2015). Emotions and Health Decision-Making: Extending the Appraisal Tendency Framework to Improve Health and Healthcare. In C. Roberto & I. Kawachi (Eds.), Behavioral economics and public health. Cambridge, MA: Harvard University Press.

Emotional State and Message Frame[3,4]

Anger
- High certainty
- High perceived control
- Low risk perception
- High reward seeking

MATCH

Gain Frame
- What one will gain from doing the preventive behavior.
- Ex: Eating plenty of fruits and vegetables can protect your child's health.

Fear
- Low certainty
- Low personal control
- High risk perception

MATCH

Loss Frame
- What one will lose by not doing the behavior.
- Ex: Not eating plenty of fruits and vegetables can endanger your child's health.

Virtual Reality Buffet

Study Design and Procedure

Methods

Sample:
- 190 parents of children 4-7 years old

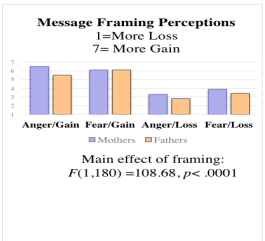
Outcome Measure:
- Number of servings of fruits and vegetables chosen from virtual reality buffet
  - Oranges, Grapes, Carrots, Corn, Green beans, Black beans

Results

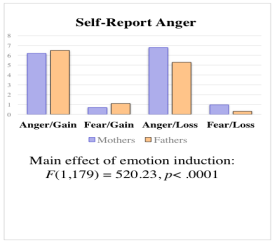
Sample Demographics
N and (%) or M and (SD)

	Mothers (n=126)	Fathers(n=64)	Total (n=190)
Race: White	60 (47%)	28 (43%)	88 (46%)
Ethnicity: Hispanic	12 (10%)	6 (10%)	18 (10%)
College educated	100 (79%)	51 (79.6%)	151 (79%)
Child gender: Female	61 (48%)	25 (39%)	86 (45%)
Parent Age	37.1 (5.7)	38.7 (5.6)	37.7 (5.7)
Child Age	5.37 (1.2)	5.44 (1.1)	5.4 (1.1)
Parent BMI	27.6	31.1	28.8 (16.5)
Child BMI	17.7 (5.3)	18.1 (8.0)	17.8 (6.3)

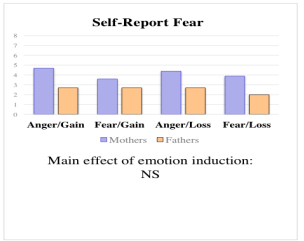
Manipulation Checks



Main effect of framing:
$F(1,180) = 108.68, p < .0001$

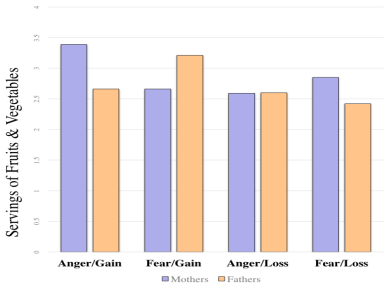


Main effect of emotion induction:
$F(1,179) = 520.23, p < .0001$



Main effect of emotion induction:
NS

Main Outcome



Main effect of servings of fruit and vegetables
3-way interaction
$F(1,175) = 5.6, p < .05$

Mothers chose more servings when they were angry and received the gain frame message. Fathers chose more servings when they were fearful and received the gain frame message.

Conclusions

- Mothers followed hypothesized pattern, based on previous literature. However, fathers followed a different pattern.
  - Will follow up on why. Possibly related to an emotion induction problem.
- Fathers are under-studied in the literature, therefore influences on behavior are not well understood.
- Future research is needed to help understand factors that influence behavior in response to health messages for **all** parents.

National Human Genome Research Institute

Capstone Project cont.

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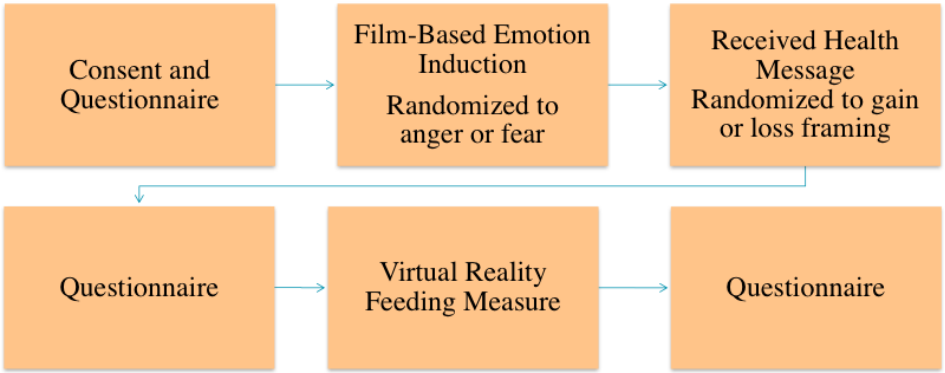

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Capstone Project cont.

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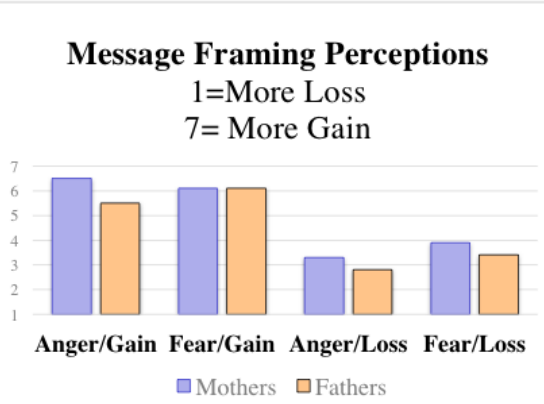

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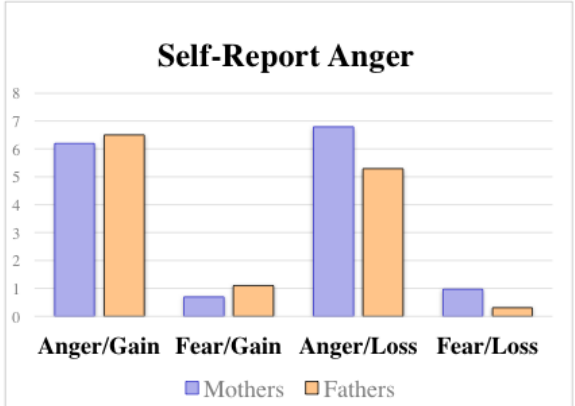

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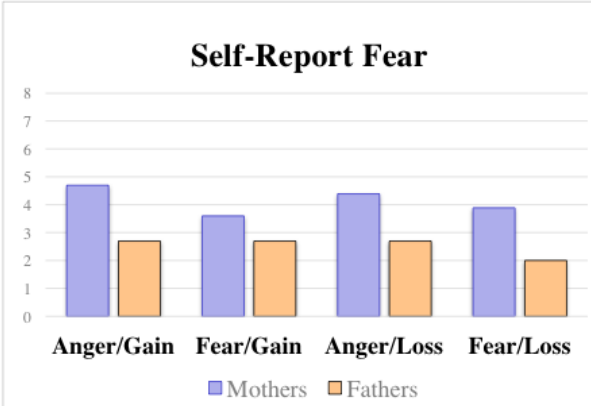

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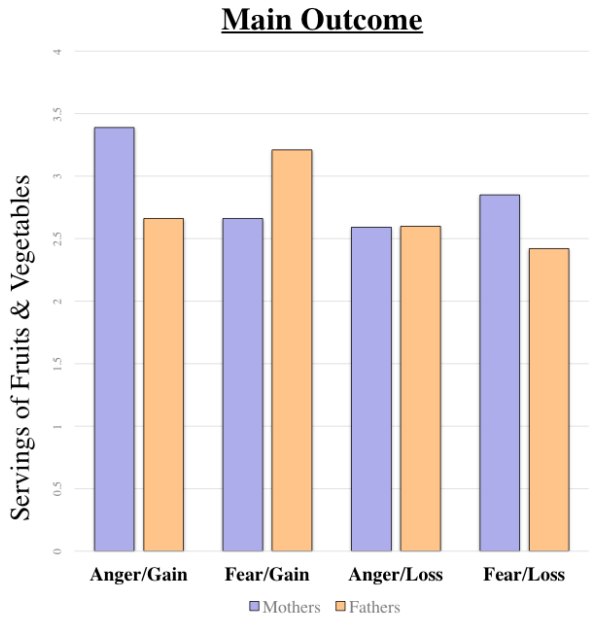

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Core Competencies

- Biostatistics

  Biostatistics was used during my field experience to analyze results using SPSS for my summer NIH research poster. Additional skills learned from biostatistics were also used to create descriptive statistics for my research question.

- Epidemiology

  In regards to the diabetes stigma study, type 2 diabetes can cause many problems. It can also be reversed through a healthy diet and physical activity. Within epidemiology, diet can be a determinant of disease which nutrition education can help prevent and control this disease

Core Competencies Cont.

- Social and Behavioral Science

  While investigating child feeding in a virtual reality buffet and the influences of message framing and parent emotion, I was able to see how different emotional behaviors such as anger or fear impacts the amount of fruits and vegetables served while receiving a certain health message.

- Environmental Health

  Within Dr. Persky's line of work with virtual reality buffet simulations and regards to my capstone project, environmental health was related in relation to the use of the virtual reality buffet reducing food waste that could have potentially existed if a real buffet was present in the NTECH study.

Core Competencies cont.

- Health Services Administration

  Health service administration could be related to my field experience by researchers lobbying to health insurance companies to pay for patients to participate in virtual reality patient research.

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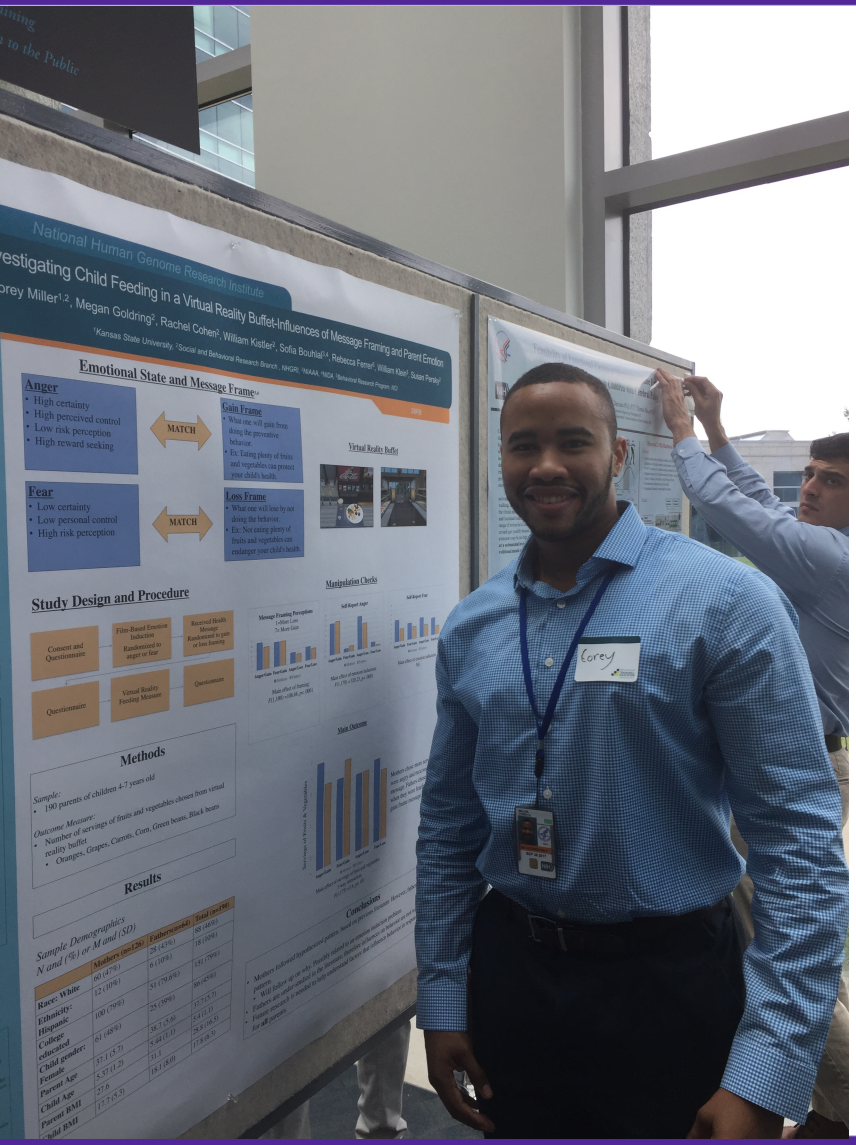
  - Dr. Nancy Muturi
  - Dr. Mark Haub
- 249ers:
  - Erika Lindshield
  - Audrey Opoku-Acheampong
  - Yijing Li
  - Yanli Wang
- Family



QUESTIONS?

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