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COLORADO SPRINGS UNDERGRADUATE RESEARCH FORUM

Saturday, April 9, 2022 | 9:00am–5:00pm

Keynote Speakers

Ken O'Donnell, PhD

Vice Provost at California State University, Dominguez Hills

Robin Scholfield and Jo-Ellen Becco

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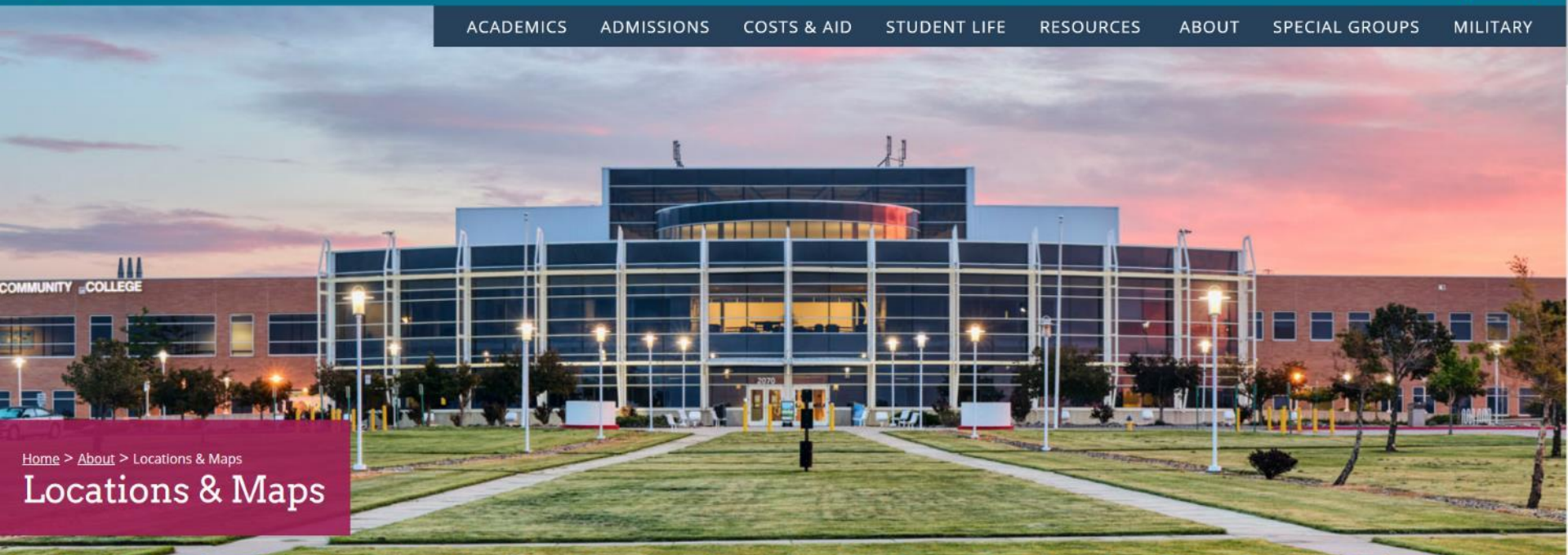
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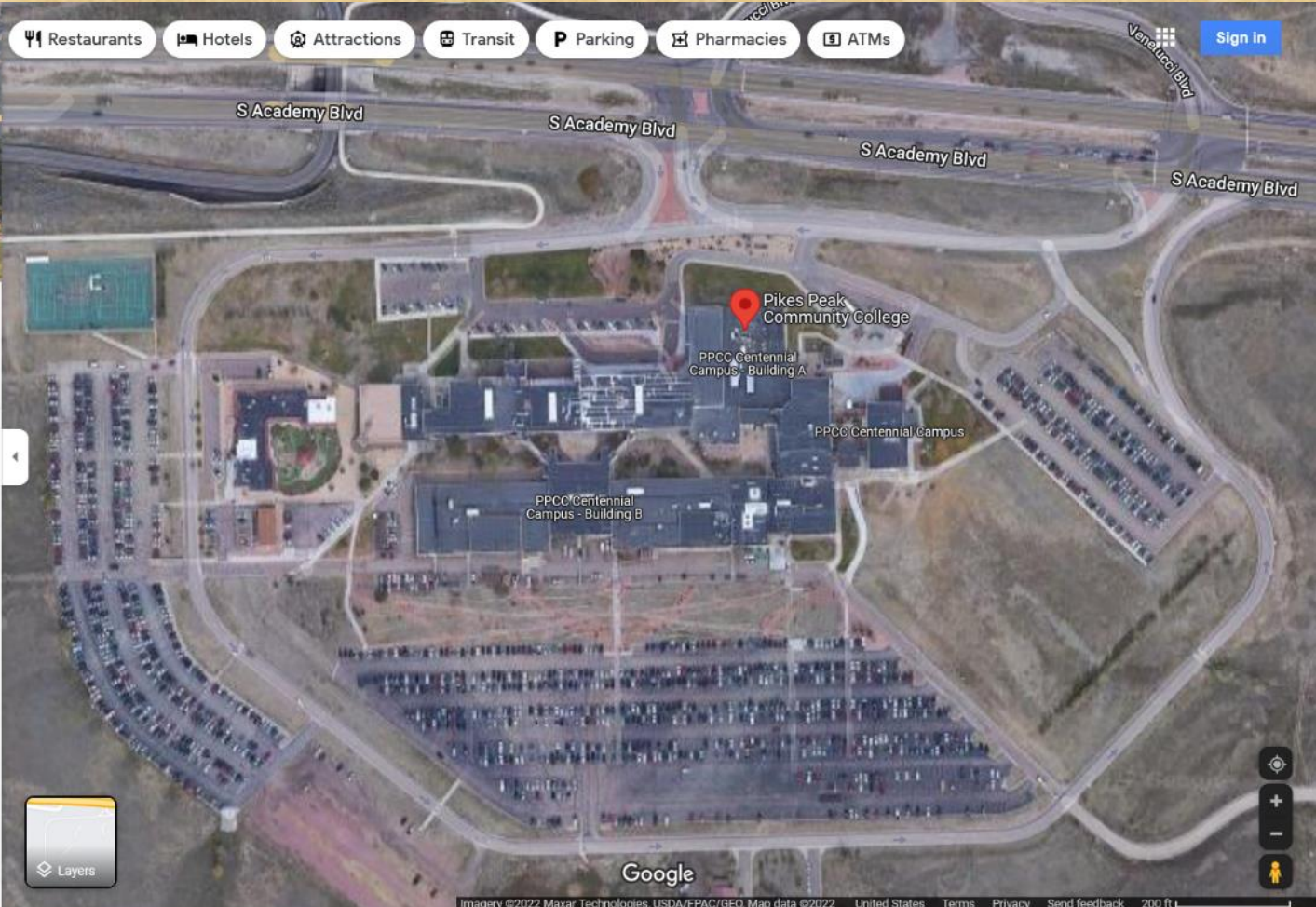


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EAST ENTRANCE



**COLORADO
COLLEGE**



Madeleine
Ross

Maya
Sikora

Julia
Nolan







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EXIT

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Orthorexia: When disordered eating becomes a moral good
 Maya Sikora
 Colorado College, Colorado Springs, CO
 Psychology

Introduction:
 Historical Connection between Eating and Moral Rightness

- Women with the Big Five have engaged in restrictive eating and consumed less than the male counterparts
- Eating and moral behavior significantly related
- For higher education of women versus in 1973 (Starnary, 1981)

Moral Foundations Theory (MFT)

- Another field is able to identify eating practices
- Participants who identified eating as a moral good were more likely to identify as female than those who did not (Starnary, 2013)

Moral Language and Food

- "Good" or "healthy" food words include: fresh, healthy, organic, high quality, nutritious, healthy, and healthy, etc.
- Participants who identified eating as a moral good were more likely to identify as female than those who did not (Starnary, 2013)

Orthorexia Nervosa (ON)

- Defined as a pathological obsession with healthy eating
- Participants who identified eating as a moral good were more likely to identify as female than those who did not (Starnary, 2013)

Participants

- Participants who identified eating as a moral good were more likely to identify as female than those who did not (Starnary, 2013)

Moral Purity of Food and Eating (MPE)

- How much was assessed for the study
- Participants who identified eating as a moral good were more likely to identify as female than those who did not (Starnary, 2013)

Hypotheses

- The MFT scale will identify participants who are more likely to identify eating as a moral good as female than those who do not (Starnary, 2013)
- Participants who identify eating as a moral good will score higher on the MFT scale than those who do not (Starnary, 2013)
- MFT will predict the relationship between eating and moral behavior (Starnary, 2013)

Methods

25 participants completed the MFT scale and the MPE scale. The MFT scale is a 10-item scale that assesses the moral foundations of eating. The MPE scale is a 10-item scale that assesses the moral purity of food and eating.

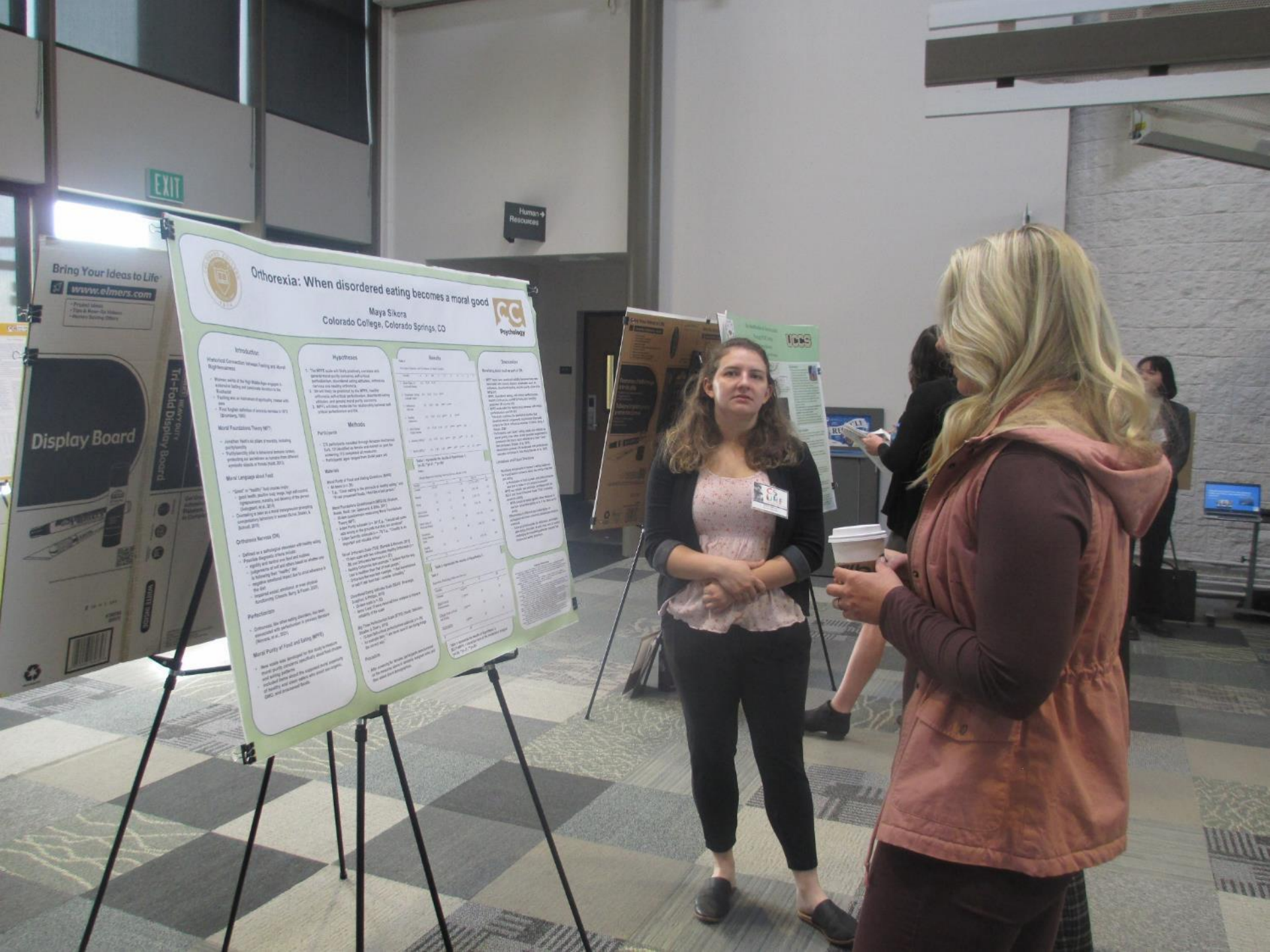
Results

Variable	Mean	SD	Min	Max
MFT Scale	1.50	0.50	1.00	2.00
MPE Scale	1.50	0.50	1.00	2.00

Discussion

Participants who identified eating as a moral good were more likely to identify as female than those who did not (Starnary, 2013). This finding is consistent with previous research that has shown that women are more likely to identify eating as a moral good than men are (Starnary, 2013). The MFT scale was a significant predictor of the relationship between eating and moral behavior (Starnary, 2013). This finding is consistent with previous research that has shown that the MFT scale is a significant predictor of moral behavior (Starnary, 2013). The MPE scale was a significant predictor of the relationship between eating and moral behavior (Starnary, 2013). This finding is consistent with previous research that has shown that the MPE scale is a significant predictor of moral behavior (Starnary, 2013).

Another poster titled "The Moral Foundations Theory (MFT) Scale" is visible in the background. It includes a table with columns for "Variable", "Mean", "SD", "Min", and "Max".





CS
UR

Maneuvering Flight in Bats

Abstract: This study investigates the aerodynamic mechanisms that enable bats to perform highly maneuverable flight. We analyze the wing morphology and flight kinematics of several bat species, focusing on the role of the wing membrane and the leading edge. Our findings suggest that the wing membrane plays a crucial role in generating lift and drag during maneuvering flight, while the leading edge provides additional control and stability. These results have implications for the design of flexible, bio-inspired aircraft.

Keywords: Bats, flight, maneuvering, aerodynamics, wing morphology, leading edge, lift, drag, bio-inspired aircraft.

Authors: [Name], [Name], [Name]

Department: [Department Name]

University: [University Name]

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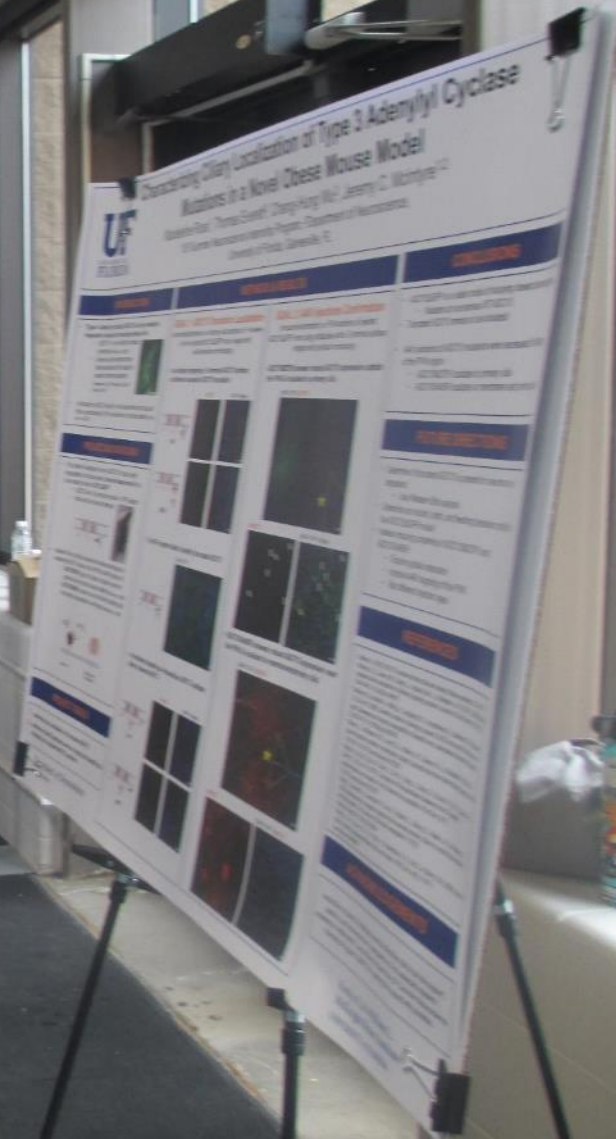
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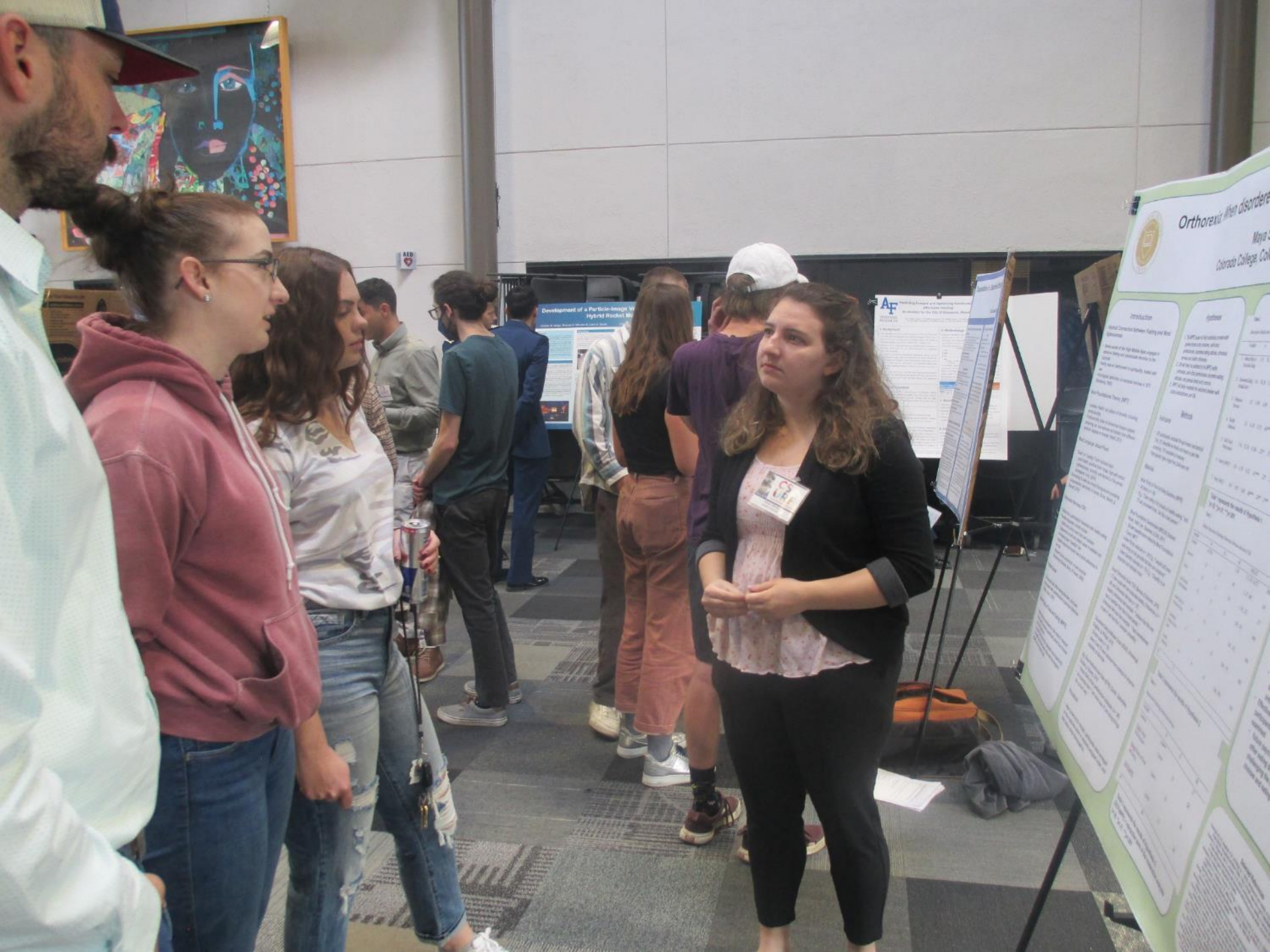
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Orthorexia: When disorders...

Maya S.
Colorado College, Colo.

Introduction

Orthorexia is a condition characterized by an obsessive focus on eating only "pure" and healthful foods. It is a form of eating disorder that is characterized by an obsessive focus on eating only "pure" and healthful foods. It is a form of eating disorder that is characterized by an obsessive focus on eating only "pure" and healthful foods.

Abstract

This study explores the prevalence of orthorexia among college students. The research was conducted using a survey of 100 students. The results show that approximately 15% of the students exhibit signs of orthorexia.

Methods

The study used a cross-sectional design. Data was collected through a self-administered survey. The survey included questions about eating habits, food preferences, and the presence of orthorexia symptoms.

Results

The survey results indicate that 15% of the participants met the criteria for orthorexia. The most common symptoms reported were obsessive focus on eating "clean" foods and avoidance of processed and artificial ingredients.

Conclusion

The findings suggest that orthorexia is a significant issue among college students. Further research is needed to understand the underlying causes and effective interventions for this condition.

Development of a Particle-Triggered Hybrid Product

AF

Poster on a tripod stand, partially visible, containing text and possibly a diagram or chart.

Two women in the foreground are engaged in conversation. The woman on the left is wearing a pink hoodie and glasses, while the woman on the right is wearing a white shirt and jeans. They appear to be discussing the research presented at the fair.

A woman in a black cardigan and pink top is looking towards the camera. She has a name tag on her chest and is standing near the large poster on the right.

Development of a Particle-Image Velocimetry Hybrid Rocket Motors

Dr. Joseph M. Joseph, Thomas W. Wilson, & Luke M. Kester
United States Air Force Research Laboratory



AF

Practical Design and Operating Experience of
the Hybrid Rocket Motor

1. Background

2. Methodology

3. Results and Conclusions

4. Future Work





Characterizing Ciliary Localization of Type 3 Mutations in a Novel Obese Mouse Model

Madeleine Ross¹, Thomas Everett², Chang-Hung Wu², Jeannette Ross²
¹UF Summer Neuroscience Internship Program, ²Department of Neuroscience, University of Florida, Gainesville, FL

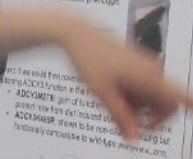
INTRODUCTION

- Type 3 adenylyl cyclase (ADCY3) is a key metabolic regulator localized to neuronal primary cilia
- ADCY3 is a novel obesity phenotype (Wu et al. 2008)
- Genetic polymorphisms have been associated with obesity in several human populations (Wu et al. 2007; Wu et al. 2013; Wu et al. 2015)
- Inhibition of ADCY3 activity in the paraventricular nucleus of the hypothalamus (PVN) is sufficient to produce obesity (Wu et al. 2015)



PROJECT BACKGROUND

- To further investigate the role of ADCY3 in body weight regulation, we first developed a novel mouse model with a truncating mutation in ADCY3 (ADCY3^{MUT})
- ADCY3 with a C-terminal truncation + GFP reporter + mice will be used for phenotypic analysis



PROJECT GOALS

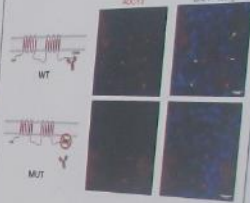
- Determine the localization of truncated ADCY3
 - Determine if AAV injections were an effective strategy to rescue the phenotype of mutant ADCY3 mice
- Department of Neuroscience
University of Florida

METHODS & RESULTS

GOAL 1: ADCY3 Truncation Localization

Immunohistochemistry on olfactory bulb sections of ~14-week-old non-injected ADCY3ΔGFP mice; imaged with epifluorescence microscopy

An antibody targeting a C-terminal ADCY3 epitope confirmed successful ADCY3 truncation



The GFP reporter failed to identify truncated ADCY3



An antibody targeting an intracellular ADCY3 epitope failed to detect ADCY3



GOAL 2: AAV Injections

Immunohistochemistry on PVN sections of ADCY3ΔGFP mice using antibodies with imaged with confocal microscopy

ADCY3M279I showed robust ADCY3 in the PVN & localized to primary cilia



ADCY3K465R showed robust ADCY3 expression in the PVN & localized to membrane/primary cilia





The Effect Initial Mass of Cop Formula

Initial Mass	Final Mass	Change	Percentage Change
100	100	0	0%
100	105	5	5%
100	110	10	10%
100	115	15	15%
100	120	20	20%
100	125	25	25%
100	130	30	30%
100	135	35	35%
100	140	40	40%
100	145	45	45%
100	150	50	50%

EXIT

ATRIUM

AF
DISORDERED EATING RESEARCH
 Predicting Demand and Optimizing Care for
 An Air Force Personnel Center
 An Analysis for the City of Cheyenne, Wyoming

I. Background
 The Air Force Personnel Center (AFPC) is the largest civilian employer in Cheyenne, Wyoming, with over 20,000 employees. AFPC employees provide critical support to the Air Force, including recruitment, assignment, and retention services. The City of Cheyenne is interested in understanding the demand and well-being of AFPC employees to better support their needs and optimize the services they provide.

II. Methodology
 This study utilized a mixed-methods approach, including surveys, focus groups, and interviews with AFPC employees and city officials. The surveys assessed employee stress levels, job satisfaction, and perceptions of demand. Focus groups and interviews provided additional insights into the challenges faced by employees and the needs of the city.

III. Findings
 The study identified several key findings related to employee demand and well-being. High levels of stress and burnout were reported, particularly among employees in high-demand roles. Job satisfaction was generally low, with many employees citing long hours, high workload, and limited resources as major concerns. The findings also highlighted the importance of mental health support and employee assistance programs for AFPC employees.

IV. Recommendations
 Based on the findings, several recommendations were made to address the identified issues. These include implementing workload management strategies, providing additional training and resources, and enhancing mental health and employee assistance programs. The city is encouraged to prioritize the well-being of AFPC employees to ensure the continued effectiveness of their services.

Dissociation in Disordered Eating: Development of a New Scale
 The Colorado College

Binge Eating & Binge Eating Disorder
 Binge eating is a recurrent, discrete episode of eating that involves eating a large quantity of food when not hungry. Binge eating is often accompanied by a sense of loss of control over eating behavior. Binge eating disorder (BED) is a chronic condition characterized by recurrent binge eating episodes. The DSM-5 criteria for BED include eating an unusually large amount of food during a discrete period of time, a sense of loss of control during the episode, and the episode is associated with distress or impairment.

Disociation
 Disociation is a mental process that occurs when a person feels detached from their body, thoughts, or feelings. It is often associated with trauma and can be a symptom of post-traumatic stress disorder (PTSD). Disociation can also occur in individuals with eating disorders, particularly in the context of binge eating episodes.

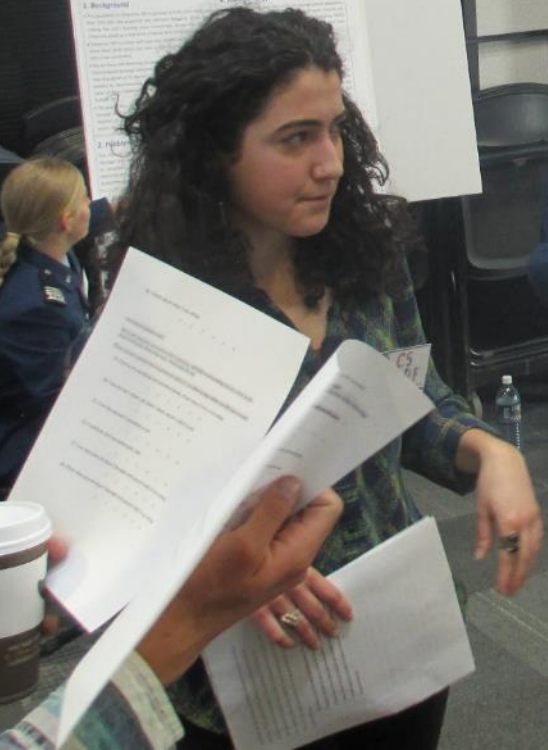
Disociation in Disordered Eating
 Disociation is a common experience for individuals with disordered eating. It is often reported during binge eating episodes, where individuals feel a sense of detachment from their body and actions. This disociation can be a coping mechanism to deal with overwhelming emotions or stress. Understanding the relationship between disociation and disordered eating is important for developing effective treatment strategies.

Development of a New Scale
 The purpose of this study was to develop a new scale to measure disociation in disordered eating. The new scale, the Disociation in Disordered Eating Scale (DDES), was developed based on a review of the literature and input from individuals with disordered eating. The DDES consists of 10 items that assess the frequency and severity of disociation during binge eating episodes. The scale is designed to be easy to use and to provide a reliable measure of disociation in disordered eating.

Psychometric Properties
 The DDES was tested on a sample of individuals with disordered eating. The results of the psychometric testing indicate that the DDES is a reliable and valid measure of disociation in disordered eating. The scale has good internal consistency and is able to distinguish between individuals with and without disordered eating. The DDES is a promising tool for assessing disociation in disordered eating and for tracking treatment progress.

Disociation in Disordered Eating Scale (DDES)
 The DDES is a 10-item scale that assesses disociation during binge eating episodes. The items are rated on a 5-point scale from 1 (never) to 5 (always).

Item	1	2	3	4	5
1. I feel detached from my body during binge eating episodes.					
2. I feel like I am watching myself eat during binge eating episodes.					
3. I feel like I am not in control of my eating during binge eating episodes.					
4. I feel like I am eating for hours without realizing it during binge eating episodes.					
5. I feel like I am eating things I don't usually eat during binge eating episodes.					
6. I feel like I am eating much more than I am hungry for during binge eating episodes.					
7. I feel like I am eating until I feel physically uncomfortable during binge eating episodes.					
8. I feel like I am eating until I feel full during binge eating episodes.					
9. I feel like I am eating until I feel sick during binge eating episodes.					
10. I feel like I am eating until I feel dizzy during binge eating episodes.					



Orthorexia: When disordered eating becomes a moral good

Maya Sikora
Colorado College, Colorado Springs, CO



Introduction

Orthorexia: A Connection between Eating and Moral Perfectionism

Recent studies of the High Middle Ages revealed a historical link between moral perfectionism and orthorexia, a disordered eating pattern characterized by an obsessive focus on consuming only "pure" or "wholesome" foods. This study explores the relationship between moral perfectionism and orthorexia, and how this relationship is moderated by perfectionism and orthorexia scores.

Orthorexia: A Connection between Eating and Moral Perfectionism

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Hypotheses

- The MPE scale will show positive correlations with general moral orientation, self-critical perfectionism, disordered eating, obsessive orthorexia, and healthy orthorexia.
- ON will mediate the relationship between MPE and orthorexia, such that individuals with high MPE scores will have higher ON scores, which in turn will lead to higher orthorexia scores.
- MPE will mediate the relationship between self-critical perfectionism and orthorexia.

Methods

Participants

278 participants were recruited from a psychology class at Colorado College. The sample was 75% female and 25% male. Participants ranged in age from 18 to 25 years old.

Measures

Morality as a Food and Eating Quality (MFEQ)

- 10-item scale (e.g., "Eating is the process of healthy living")
- 10-item scale (e.g., "Eating is a moral act")

Morality as a Food and Eating Quality (MFEQ)

- 10-item scale (e.g., "Eating is the process of healthy living")
- 10-item scale (e.g., "Eating is a moral act")

Results

Table 1

Variable	1	2	3	4	5	6	7	8	9	10
1. MPE	1.00									
2. ON	.32**	1.00								
3. Orthorexia	.18**	.12**	1.00							
4. Healthy Orthorexia	.12**	.08**	.05**	1.00						
5. Disordered Eating	.15**	.10**	.08**	.12**	1.00					
6. Self-critical Perfectionism	.18**	.12**	.10**	.15**	.18**	1.00				
7. Moral Perfectionism	.15**	.10**	.08**	.12**	.15**	.18**	1.00			
8. MPE	.12**	.08**	.05**	.10**	.12**	.15**	.18**	1.00		
9. Orthorexia	.10**	.05**	.02**	.08**	.10**	.12**	.15**	.18**	1.00	
10. Healthy Orthorexia	.08**	.02**	.01**	.05**	.08**	.10**	.12**	.15**	.18**	1.00

Table 2

Model	OR	95% CI	p
Model 1	1.05	(1.02, 1.08)	.001
Model 2	1.02	(1.00, 1.04)	.001
Model 3	1.01	(1.00, 1.02)	.001
Model 4	1.01	(1.00, 1.02)	.001
Model 5	1.01	(1.00, 1.02)	.001
Model 6	1.01	(1.00, 1.02)	.001
Model 7	1.01	(1.00, 1.02)	.001
Model 8	1.01	(1.00, 1.02)	.001
Model 9	1.01	(1.00, 1.02)	.001
Model 10	1.01	(1.00, 1.02)	.001

Table 3

Model	OR	95% CI	p
Model 1	1.05	(1.02, 1.08)	.001
Model 2	1.02	(1.00, 1.04)	.001
Model 3	1.01	(1.00, 1.02)	.001
Model 4	1.01	(1.00, 1.02)	.001
Model 5	1.01	(1.00, 1.02)	.001
Model 6	1.01	(1.00, 1.02)	.001
Model 7	1.01	(1.00, 1.02)	.001
Model 8	1.01	(1.00, 1.02)	.001
Model 9	1.01	(1.00, 1.02)	.001
Model 10	1.01	(1.00, 1.02)	.001

Discussion

Moralizing about food as part of a healthy lifestyle is a common trend in contemporary culture. However, this trend can become a moral good when it leads to disordered eating. This study found that individuals with high scores on the MPE scale also had higher scores on the ON scale, which in turn led to higher scores on the orthorexia scale. This relationship was moderated by perfectionism and orthorexia scores.

- MPE items have construct validity associated with closely aligned constructs: orthorexia, disordered eating, and MFEQ (H1)
- MPE, disordered eating, self-critical perfectionism, and MFEQ Purify and Predicted ON scores (H2)
- MPE moderated the relationship between perfectionism and ON (H3)
- This study confirms the qualitative studies that have identified moral components as possible criteria for ON of orthorexia nervosa (Chesnut, 2020)
- Participants saw "clean" eating habits and moral goods, even when shown possible implications for someone's life due to strict adherence to the diet (Ambwani, Shippe, et al., 2019).
- Association between ON tendencies and perfectionism was also confirmed in this study (Novara et al., 2019).

Limitations and Future Directions

Moralizing components of women's eating habits should be traced back to concerns about the purity of food and eating. This moralization of food choices and eating behavior is also true in males or is it unique to women? MPE was reliable and positively correlated with the DEAS and Tarsus Orthorexia Scale (TOS), indicating construct validity. MPE should be tested against other measures to see how robust that validity is or if the items are too similar. Effectiveness of different psychotherapies on participants who have orthorexia tendencies should be examined. Future psychotherapies for orthorexia, and maybe other eating disorders as well, may need to focus on challenging the moralizing attitudes towards food choices and eating behaviors.

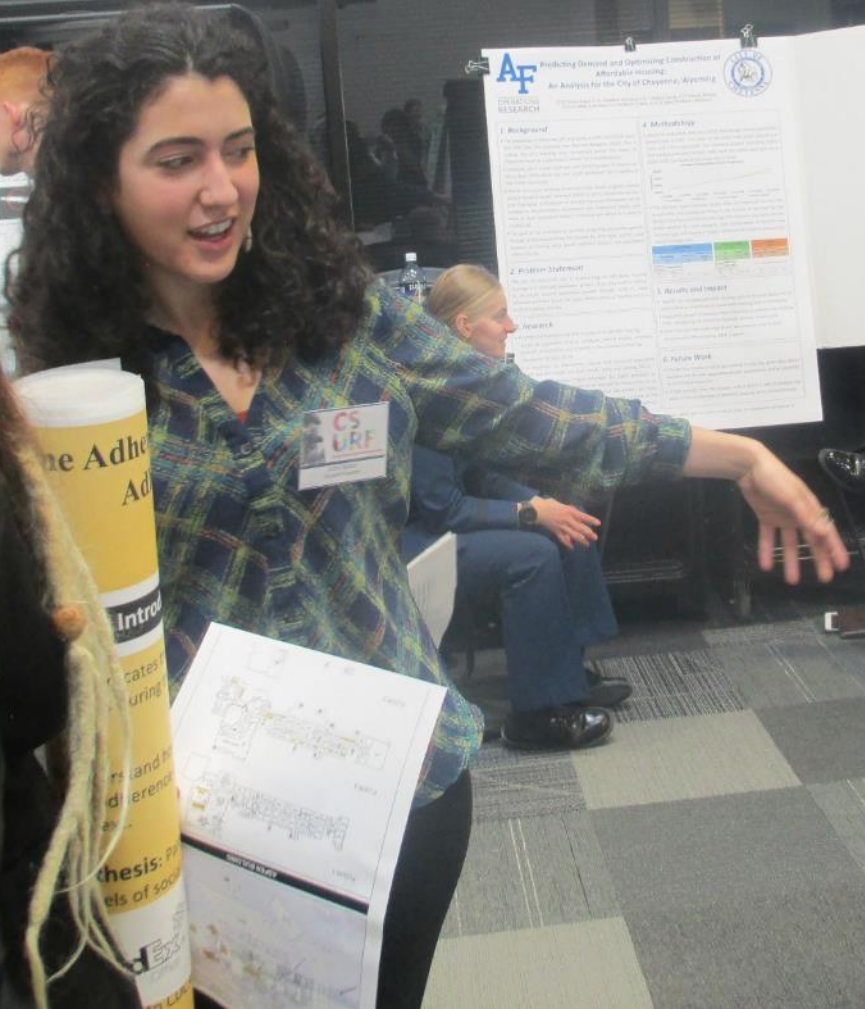
Selected References

Ambwani, S., Shippe, M., & Novara, E. (2019). The moralization of food choices and eating behavior: A qualitative study of women with orthorexia nervosa. *Journal of Health Psychology, 71*, 1-10.

Chesnut, S. L. (2020). The moralization of food choices and eating behavior: A qualitative study of women with orthorexia nervosa. *Journal of Health Psychology, 71*, 1-10.

Novara, E., Shippe, M., & Ambwani, S. (2019). The moralization of food choices and eating behavior: A qualitative study of women with orthorexia nervosa. *Journal of Health Psychology, 71*, 1-10.





AP Predicting Demand and Optimizing Load Factor of Affordable Housing: An Analysis for the City of Denver, Wyoming

1. Background

2. Problem Statement

3. Methods and Impact

4. Future Work

Dissociation in Disordered Eating: Development of a New Scale

Julia Nolan
The Colorado College, Colorado Springs

Binge Eating & Binge Eating Disorder

Binge Eating

Binge Eating Disorder - BED

Disociation

Disociative Disorders

Psychological vs. Somatoform Dissociation

Discussion

Survey & Scale

Properties of the DISS-EAT

Eating Disorder Diagnosis

Difference Between Eating Disorder Diagnosis and DISS-EAT Mean

Construction of the Dissociative Eating Scale

Scale

Purpose of Creating a New Scale

Review of the Literature

Sample of Dissociative Eating Scale (DISS-EAT)

Statistical Properties & Results

Procedure

Variable	β	SE	F	p
DISS-EAT	0.20	0.02	18.34	<.001
EDI	0.02	0.01	0.03	.882
SCQ	0.01	0.01	0.01	.913
PS	0.02	0.01	0.14	0.705



Characterizing Ciliary Localization of Type 3 Adenylyl Cyclase Mutations in a Novel Obese Mouse Model

Madeleine Ross¹, Thomas Everett², Chang-Hung Wu², Jeremy C. McIntyre^{1,2}
¹UF Summer Neuroscience Internship Program, ²Department of Neuroscience, University of Florida, Gainesville, FL

INTRODUCTION

Type 3 Adenylyl Cyclase (ADCY3) is a key mediator of ciliary signaling in retinal ganglion cells (RGCs). ADCY3 is expressed in a subset of RGCs and is essential for the development of the ciliary body. Mutations in ADCY3 lead to ciliary defects and are associated with retinal degeneration.

PROJECT BACKGROUND

A recent study by the lab of ADCY3 in RGCs revealed that the full complement of ciliary proteins is not present in all RGCs. This suggests that ADCY3 may be a marker for a subset of RGCs. We are interested in understanding the role of ADCY3 in ciliary signaling and its relationship to retinal degeneration.

PROJECT GOALS

- Determine the localization of mutated ADCY3
- Assess if RGCs express cilia and identify the localization of mutated ADCY3 proteins

METHODS & RESULTS

GOAL 1: ADCY3 Staining Localization

Immunofluorescence analysis of retinal sections from wild-type (WT) and mutant (mut) mice. We performed immunofluorescence staining for ADCY3 and cilia. We found that ADCY3 is localized to the ciliary body in WT mice but is absent in mutant mice.

GOAL 2: RAY Tracer Cilia Localization

Immunofluorescence analysis of retinal sections from WT and mutant mice. We performed immunofluorescence staining for ADCY3 and RAY tracer. We found that ADCY3 is localized to the ciliary body in WT mice but is absent in mutant mice.

CONCLUSIONS

ADCY3 is a marker for ciliary signaling in RGCs. Mutations in ADCY3 lead to ciliary defects and are associated with retinal degeneration. Our results suggest that ADCY3 is a marker for a subset of RGCs and is essential for the development of the ciliary body.

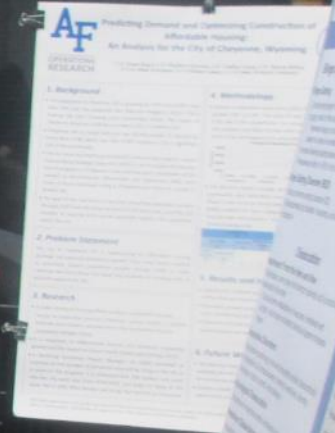
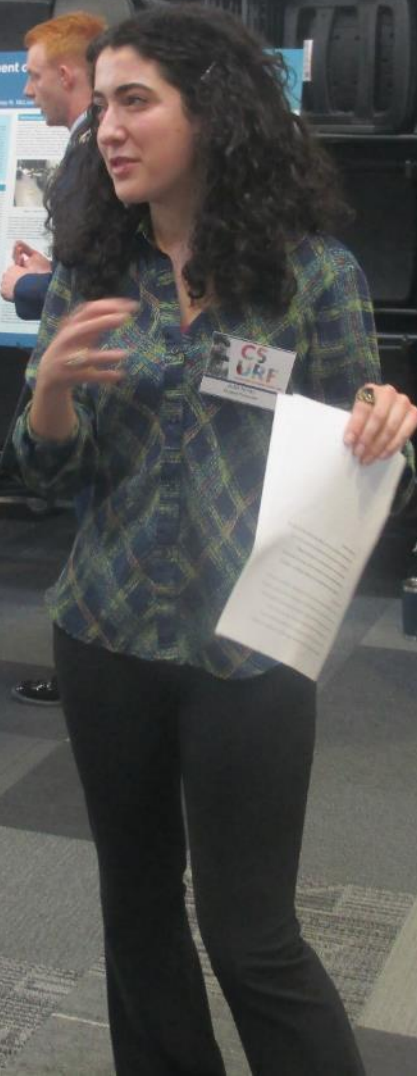
REFERENCES

McIntyre, J. C., et al. (2018). ADCY3 is a marker for ciliary signaling in retinal ganglion cells. *Journal of Neuroscience*, 38(12), 3123-3132.

Wu, C. H., et al. (2019). ADCY3 is a marker for ciliary signaling in retinal ganglion cells. *Journal of Neuroscience*, 39(12), 2456-2465.

ACKNOWLEDGMENTS

We thank Dr. John C. McLaughlin for providing the ADCY3 mutant mice. We also thank Dr. David R. Brackley for providing the RAY tracer. This work was supported by the University of Florida Summer Neuroscience Internship Program. Contact: Jeremy C. McIntyre, jcm@ufl.edu





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 11:30 am - 1:30 pm

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- Do you want to better understand the laws that impact your life and your community?*
- Or do you just have questions about the Paralegal Program?*

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Colorado Undergraduate Research Forum
April 2022



Ken O'Donnell
California State University, Dominguez Hills







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WHAT THEY ARE,
WHO HAS ACCESS TO THEM,
AND WHY THEY MATTER

BY GEORGE D. KUH

WITH AN INTRODUCTION BY CAROL GEARY SCHWEIZER
AND FINDINGS ON STUDENT SUCCESS FROM AAC&U'S
LEAP INITIATIVE



LEAP

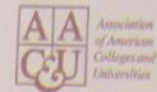


Ensuring Quality & Taking High-Impact Practices to Scale



BY GEORGE D. KUH AND KEN O'DONNELL

WITH CASE STUDIES BY SALLY REED



Delivering on the Promise of High-Impact Practices

Research and Models for Achieving
Equity, Fidelity, Impact, and Scale

Edited by
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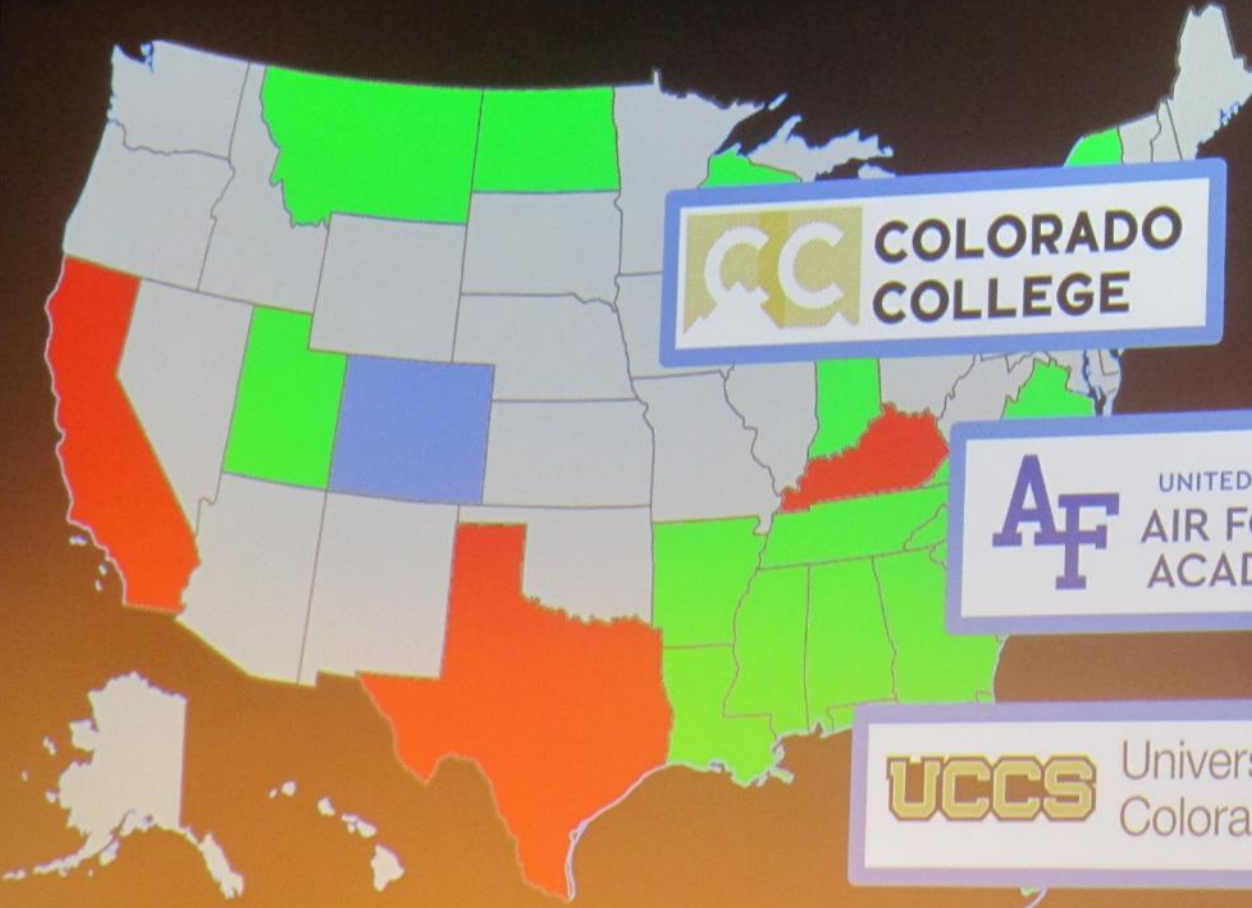
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