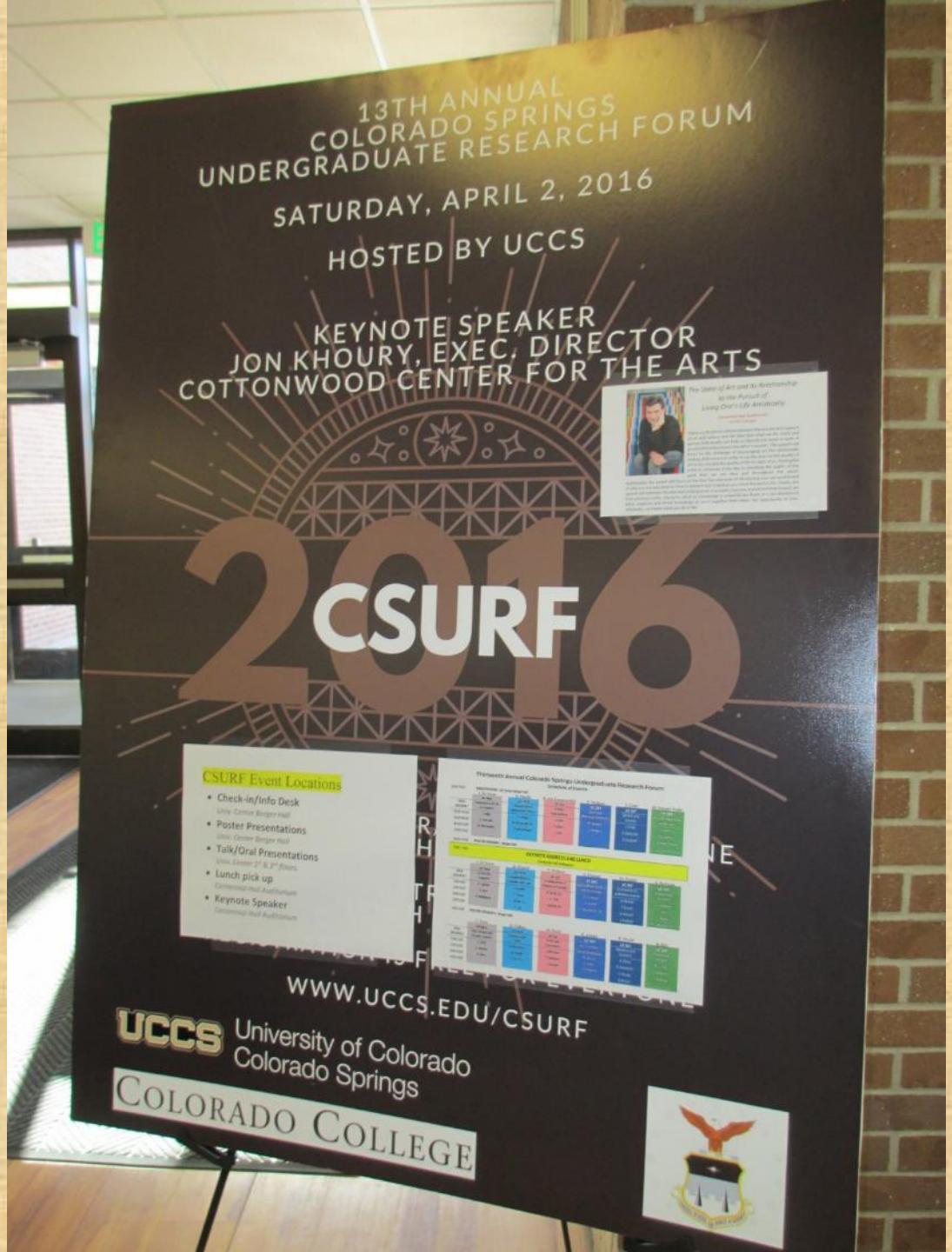
13TH ANNUAL
COLORADO SPRINGS
UNDERGRADUATE RESEARCH FORUM
SATURDAY, APRIL 2, 2016
HOSTED BY UCCS
KEYNOTE SPEAKER
JON KHOURY, EXEC. DIRECTOR
COTTONWOOD CENTER FOR THE ARTS
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CC
Thinking to the Beat of the Music
Jacqueline E. Child and Patricia Waters
The Colorado College, Colorado Springs, CO
Introduction
Objective
Background Information
Hypotheses
Method
Questionnaire
Participants
Procedure
Results
Main Effect of Music on Memory
Effect of Condition on Memory
Discussion
Findings
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Memory was better in music conditions than in silent conditions.
There was a significant difference between the silent condition and the individualized condition.
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Music did not seem to impact specific aspects of autobiographical memory, rather it was random throughout the sample.
Study Limitations
This study was limited due to its small sample size of 8 participants.
Only women participated.
This experiment was not a double-blind study.
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Future Research
Further studies with control groups consisting of a more difficult questionnaire for healthy adults.
Investigate the effectiveness of music while working with healthy individuals.
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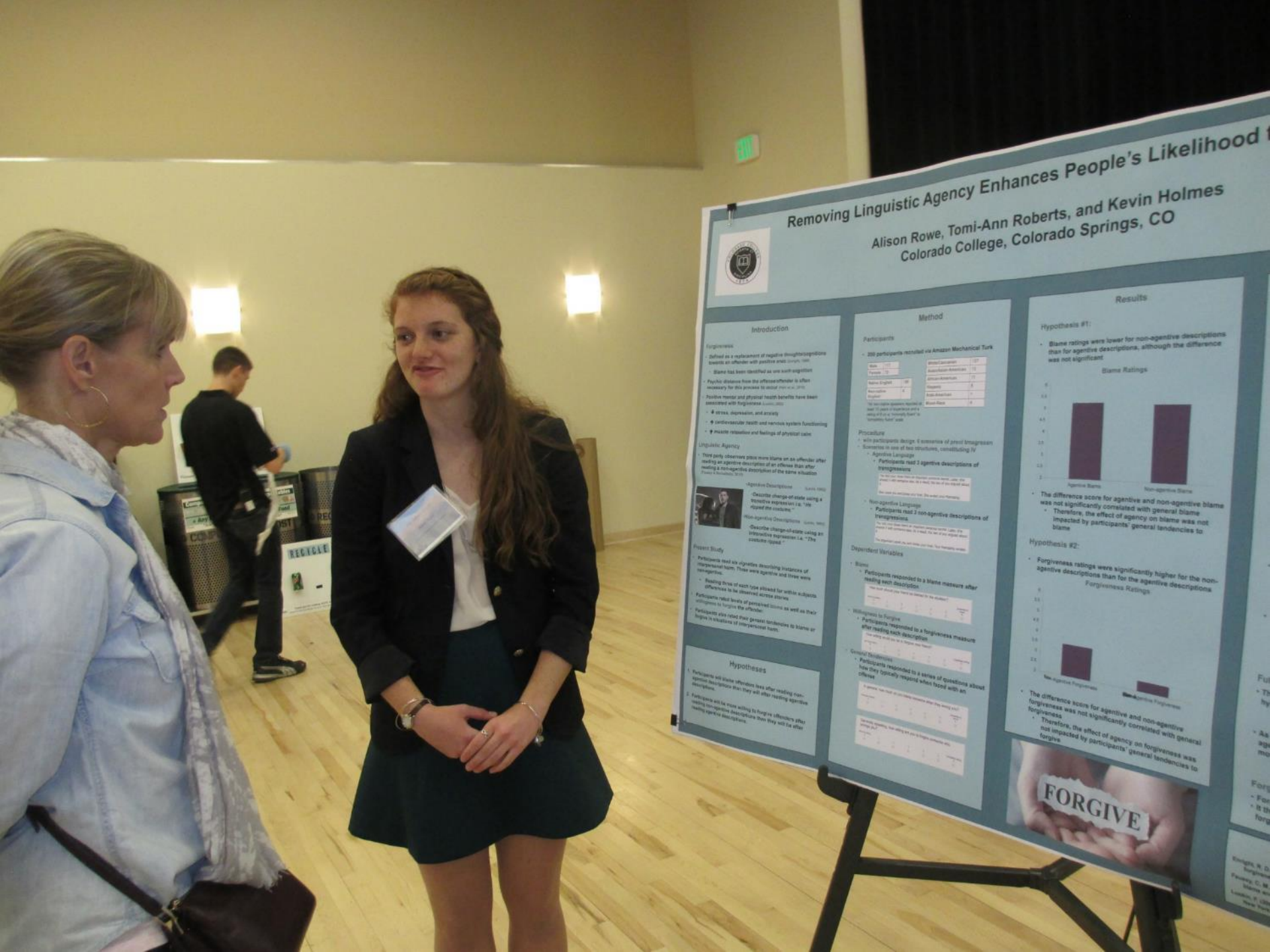
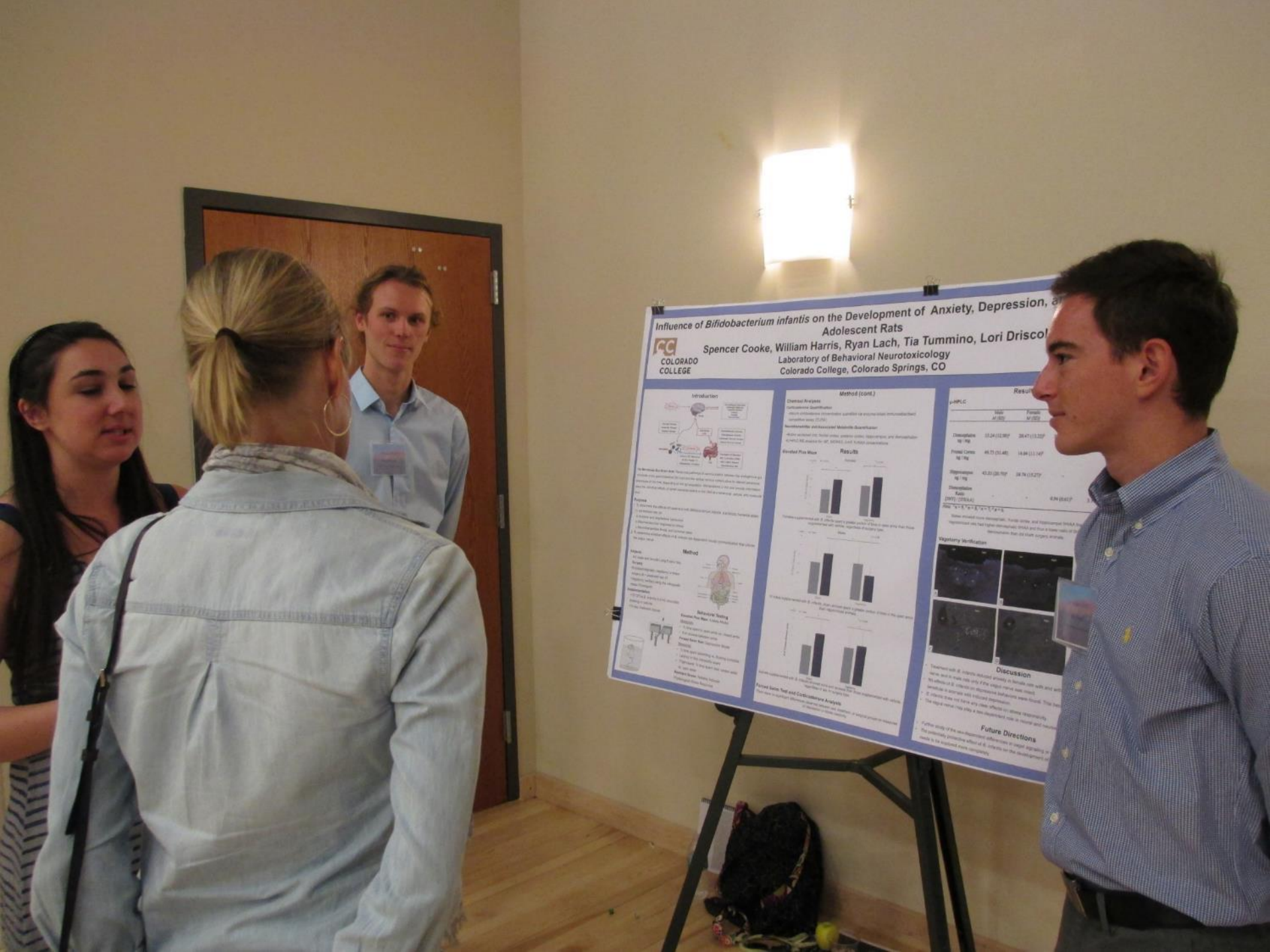
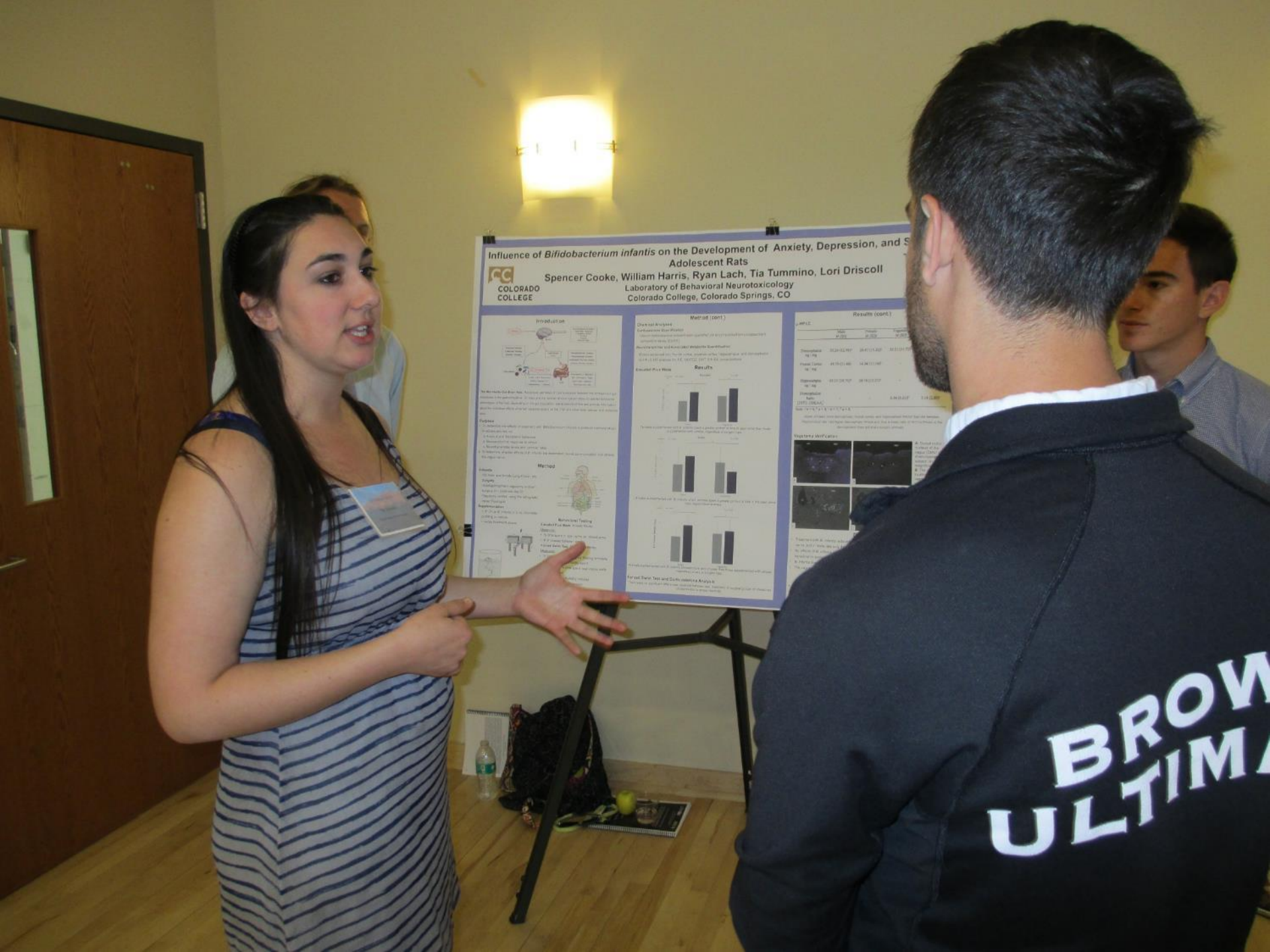
Implications
Individuals suffering from dementia should be listening to individualized music to enhance autobiographical memory.
This is a non-pharmacological alternative for memory enhancement for patients with Alzheimer's disease.
Selected References


Removing Linguistic Agency Enhances People's Likelihood
Alison Rowe, Tomi-Ann Roberts, and Kevin Holmes
Colorado College, Colorado Springs, CO
Introduction
Method
Results
Hypothesis #1:
Blame ratings were lower for non-agentive descriptions than for agentive descriptions, although the difference was not significant
Blame Ratings
Agentive Blame
Non-agentive Blame
The difference score for agentive and non-agentive blame was not significantly correlated with general blame
Therefore, the effect of agency on blame was not impacted by participants' general tendencies to blame
Hypothesis #2:
Forgiveness ratings were significantly higher for the non-agentive descriptions than for the agentive descriptions
Forgiveness Ratings
The difference score for agentive and non-agentive forgiveness was not significantly correlated with general forgiveness
Therefore, the effect of agency on forgiveness was not impacted by participants' general tendencies to forgive
FORGIVE
RECYCLE


nparative Neuronal Morphology of Gigantopyramidal Neurons in
Felids, Primates, Ungulates, the Wallaby, and the Rat
Mackenzie Tennison
Colorado College, Colorado Springs, CO
Mongoose
Siberian Tiger
Baboon
Lemur
Zebra
Results and Discussion


Influence of Bifidobacterium infantis on the Development of Anxiety, Depression,
Adolescent Rats
Spencer Cooke, William Harris, Ryan Lach, Tia Tummino, Lori Drisco
COLORADO COLLEGE
Laboratory of Behavioral Neurotoxicology
Colorado College, Colorado Springs, CO
Introduction
Method (cont.)
Results
Method
Discussion
Future Directions


Thinking to the Bea
Jacqueline E. Child and
The Colorado College, Col
Introduction
Objective
Background Information
Hypotheses
Method
Questionnaire
Participants (N = 6)
Procedure
Results
Main Effect of Music on Memory
Effect of Condition on Memory
RECYCLE
LANDFILL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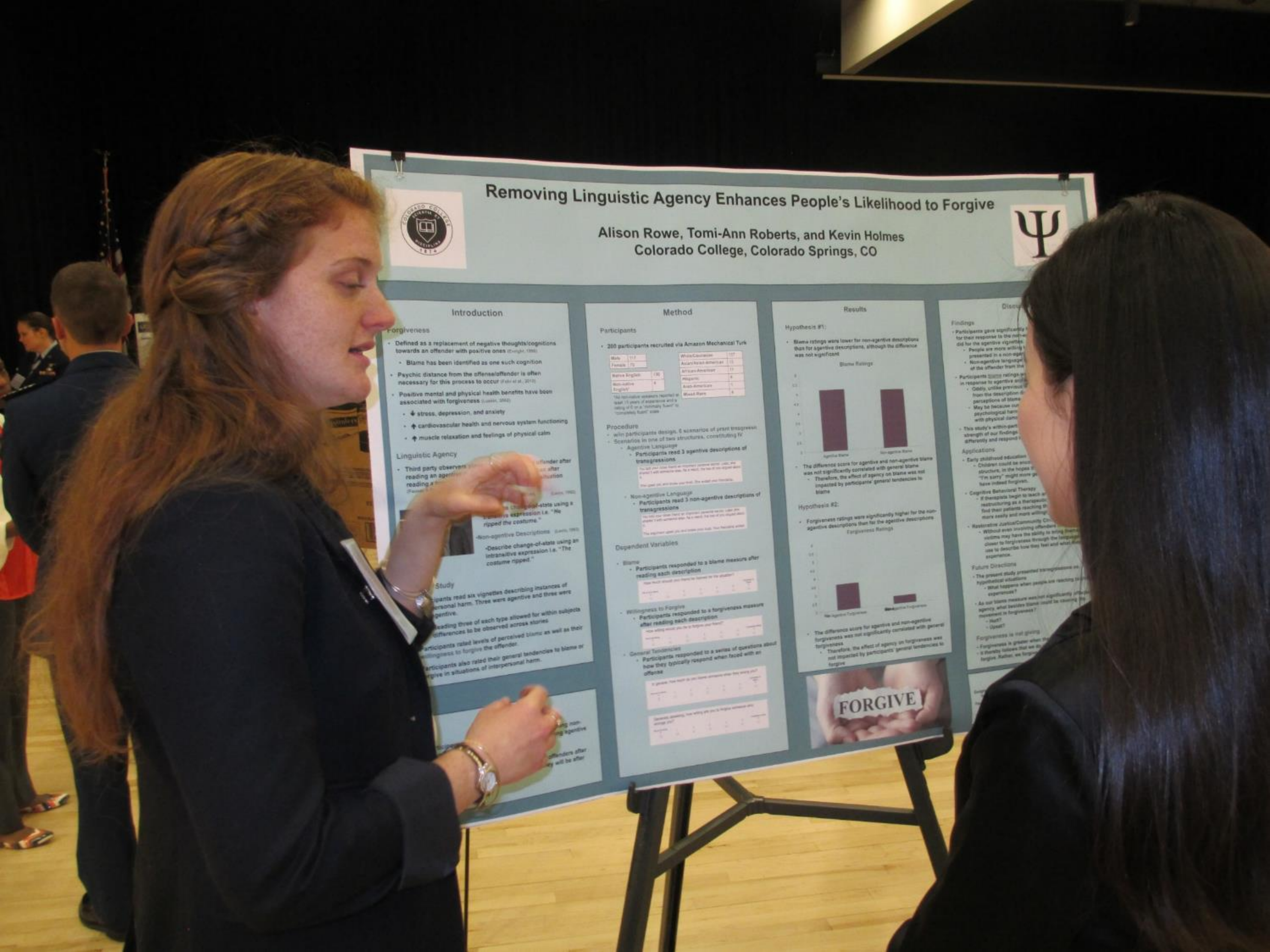
Introduction
Method
Method (cont.)
Results
Results (cont.)
BROW
ULTIMA


Removing Linguistic Agency Enhances People's Likelihood to Forgive
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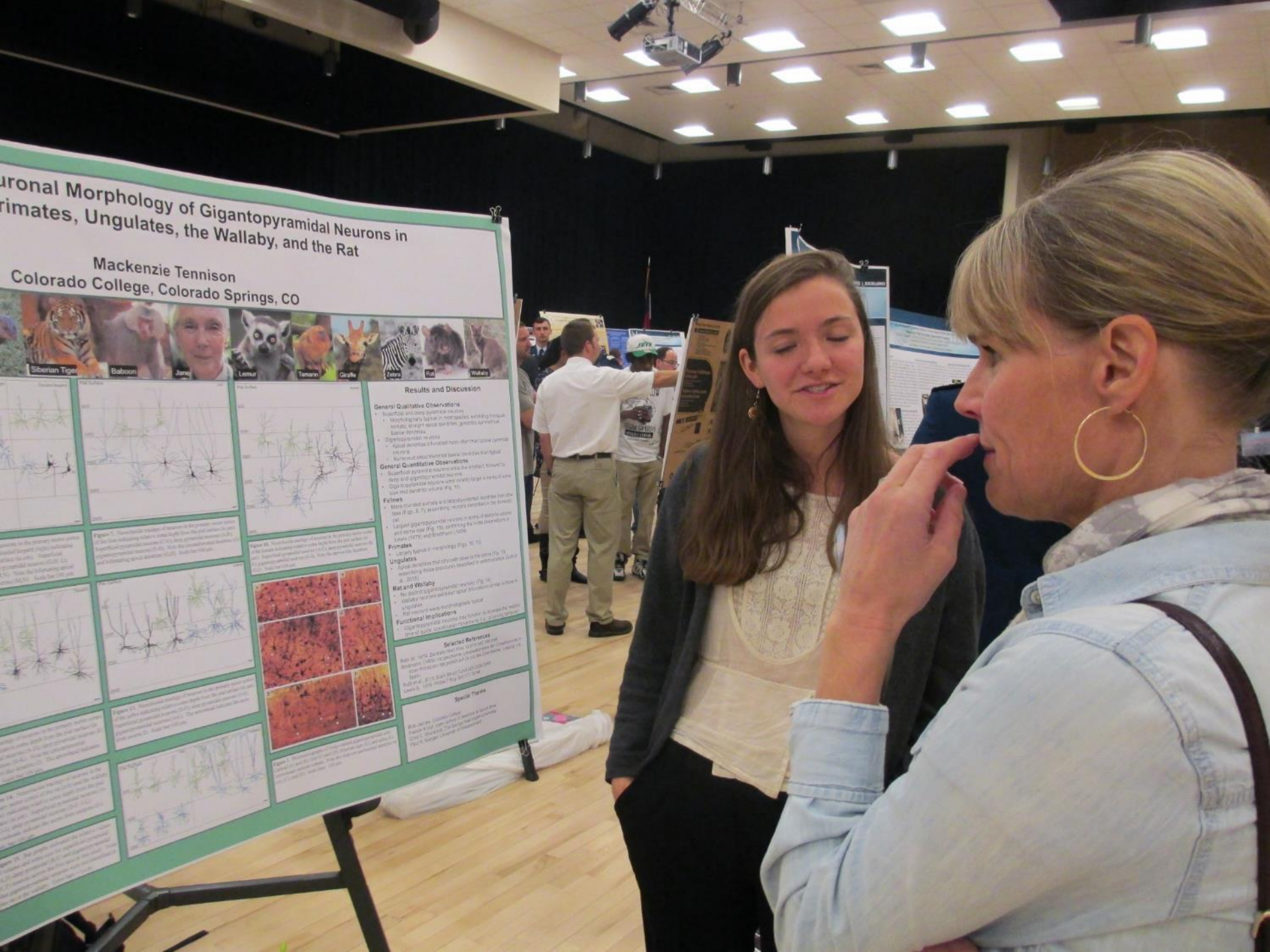
Colorado College, Colorado Springs, CO
Introduction
Forgiveness
Defined as a replacement of negative thoughts/cognitions towards an offender with positive ones
Blame has been identified as one such cognition
Psychic distance from the offense/offender is often necessary for this process to occur
Positive mental and physical health benefits have been associated with forgiveness
stress, depression, and anxiety
cardiovascular health and nervous system functioning
muscle relaxation and feelings of physical calm
Linguistic Agency
Method
Participants
200 participants recruited via Amazon Mechanical Turk
Procedure
Dependent Variables
Results
Hypothesis #1:
Hypothesis #2:
FORGIVE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Results and Discussion
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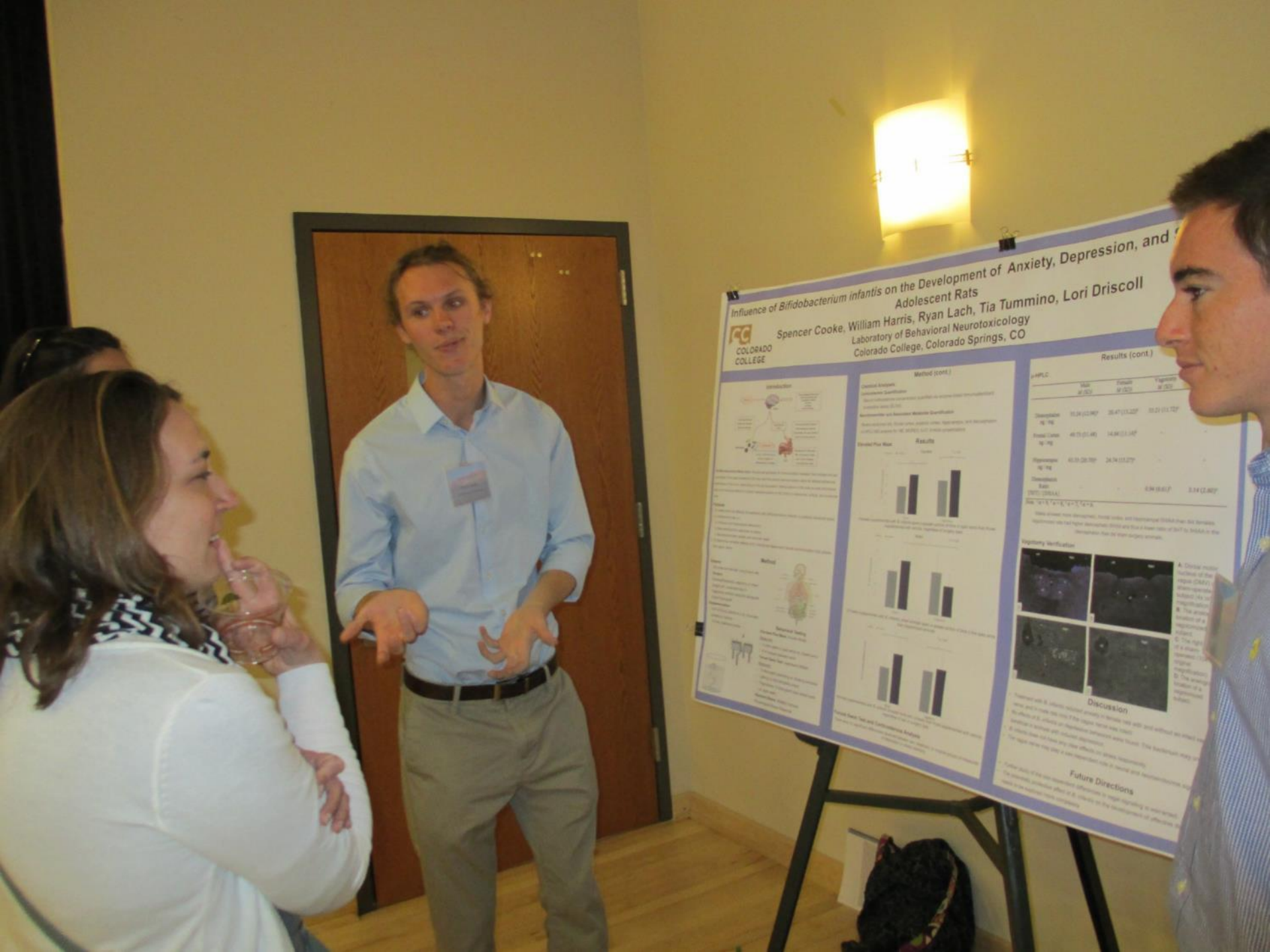
General Quantitative Observations
Felines
Primates
Ungulates
Rat and Wallaby
Functional Implications
Selected References
Special Thanks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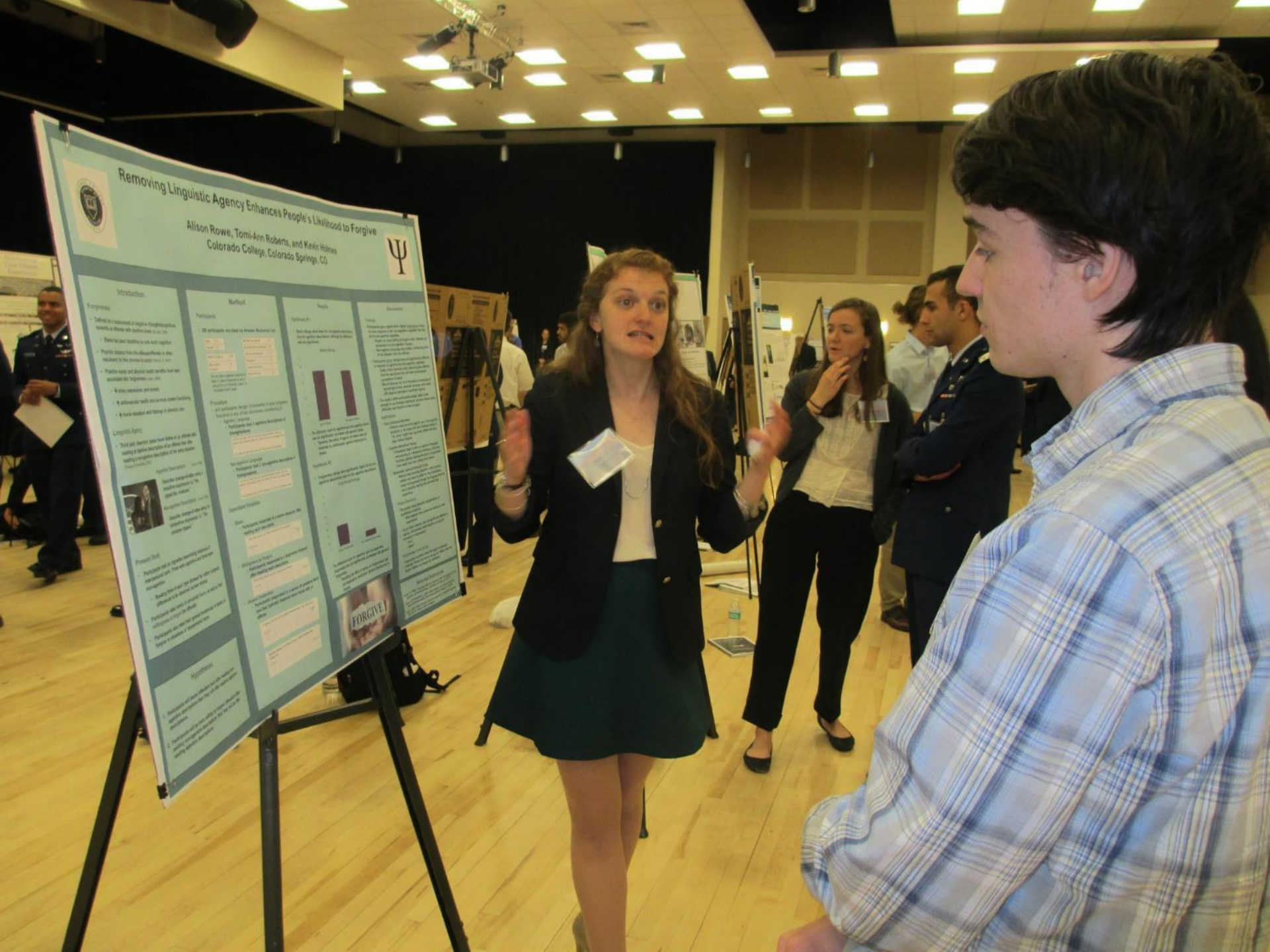
Method
Method (cont.)
Results
Results (cont.)
Discussion
Future Directions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Introduction
Method
Results
Discussion
Linguistic Agency
Present Work
Hypothesis
FORGIVE

Thinking to the Beat of the Music

Jacqueline E. Child and Patricia Waters
The Colorado College, Colorado Springs, CO

Introduction

Objective

To determine if music can enhance autobiographical memories in those with dementia under three conditions: individualized, random, or silence.

Background Information

Two most common types of dementia: Alzheimer's disease and vascular dementia (Roman, 2002).

Autobiographical memories are the first to diminish in AD (Irish et al., 2006).

Music, more than cafeteria noise, enhances autobiographical memories, suggesting that noise improves recall, but music is superior to noise (Fowler & Valentine, 2001).

Hypotheses

1. Autobiographical memory will be enhanced when listening to music.

2. Individualized music will enhance the participants' memory the most, followed by random music. Silence will not have any affect on memory.

Method

Questionnaire

Life Events List- Questionnaire sent to families of participants to determine autobiographical memories. (ex: wedding date, birth of first child, holiday)

Assessment of Personal Music Preference (Family Version)- Family members completed this form to determine the participants' favorite music from the past. This music was used for the individualized condition.

Modified Rouleau Clock Scale- Participants were asked to draw a clock to the best of their ability. It was scored out of 16 (Brief qualitative scale).

Participants (N = 8)

Participants were recruited from an extended care facility in the Colorado Springs area. Staff from the facility selected residents who have mild-moderate dementia.

All participants were women, ages ranged from 81-95. Informed consent and assent was received.

Variables

Participants were tested under three conditions: individualized music, random music condition.

Dependent variable: autobiographical memory enhancement.

Procedure

Participants were tested in a small quiet room.

Participants first completed the Modified Rouleau Clock Drawing Task, which tested cognitive ability.

Music conditions were counterbalanced to prevent practice effects.

Participants were tested three times (one week in between each condition). Each session took approximately 30 minutes.

Participants were tested on their autobiographical memory using the Life Events List.

Each participant received compensation at the end of the study (funded by the Keller Family Venture Grant Fund).

Results

Main Effect of Music on Memory

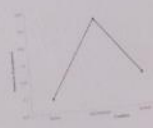
A test of within subject effects revealed no differences in memory based on the order of the music conditions (counterbalancing), $p = .59$.

A repeated measures ANOVA measuring impact of music on memory enhancement was found to be significant, $F(2,14) = 5.47$, $p = 0.02$, $\eta_p^2 = 0.44$.

There was a trend between memory enhancement induced by random music and individualized music, $p = .052$.

Due to limited data, cognitive ability measured by the Modified Rouleau Clock Drawing Scale could not be analyzed.

Effect of Condition on Memory



Post hoc tests demonstrated a significant difference between the memory score in the silence condition ($M = 0.29$) and the individualized condition ($M = 0.52$), $p = 0.02$.

Discussion

Findings

Individualized music enhances autobiographical memory.

Memory was better in music conditions than in silent conditions.

There was a significant difference between the silent condition and the individualized condition.

For a dementia patient, autobiographical memory is enhanced when listening to individualized music.

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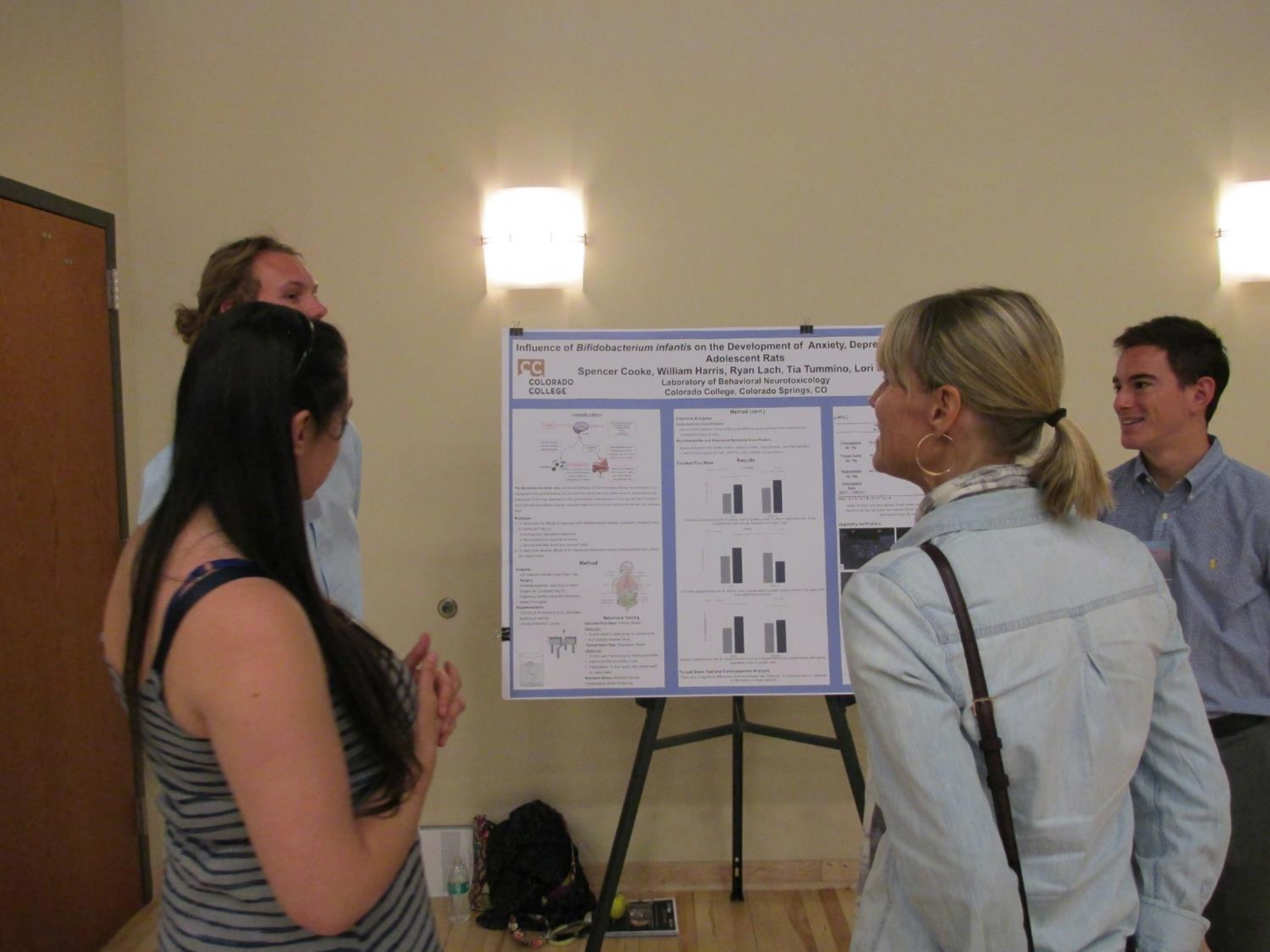
Selected Refere

Fowler, M. A., & Valentine, E. R. (2001). The effect of auditory stimuli on memory in dementia. Experimental Aging Research, 27(2), 171-184. doi:10.1080/03610730152007854

Irish, M., Cunningham, C. J., Walsh, J. B., Coakley, D., Lawlor, B. A., Robertson, I. H., & Coen, R. F. (2006). Investigating the enhancing effect of music on autobiographical memory in mild Alzheimer's disease. Dementia and Geriatric Cognitive Disorders, 22(1), 108-120. doi:10.1159/000092667

Roman, G. C. (2002). Defining dementia: clinical criteria and beyond. Acta Neurologica Scandinavica. Supplementum, 178, 7-12.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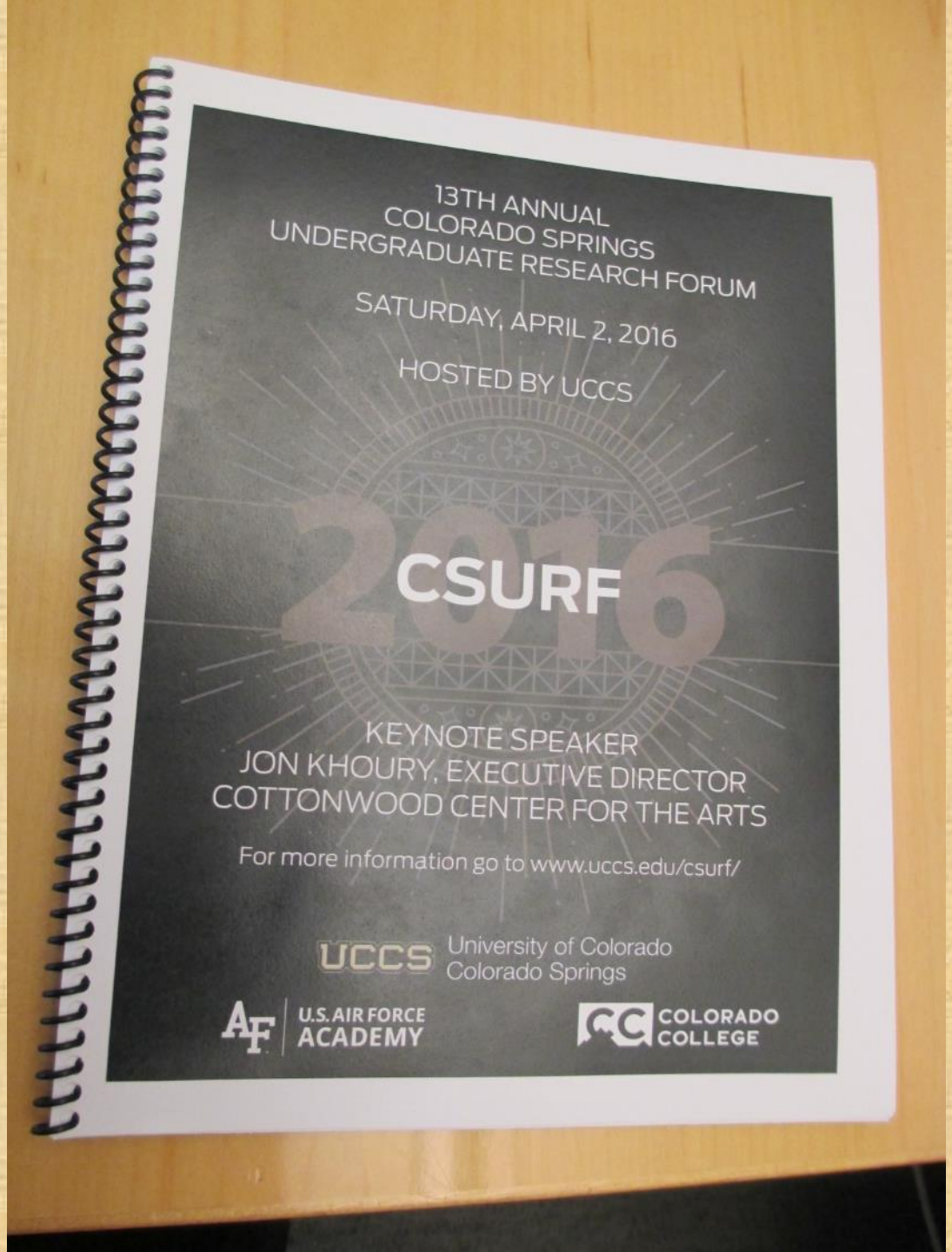
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