

*27th Annual Westmont College*  
**Student Research  
Symposium**



April 20, 2023  
3:30-5:00 p.m.

*Winter Hall  
Westmont College*

# 2023 Spring Research Symposium

April 20, 2023  
3:30-5:00 p.m.

*Winter Hall  
Westmont College*

## **PARTICIPANTS**

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**Sydney Azzarello '23**

Sociology

Poster #13

**John Baker '23**

Chemistry

Poster #28

**Leannah Barreto '23**

Psychology

Poster #6

**Lydia Bastian '23**

Sociology

Poster #21

**Charlie Bloom '25**

Kinesiology

Poster #4

**Nicole Bond '23**

Chemistry

Poster #28

**Riley Bream '24**

Psychology

Poster #3

**Kennedy Burkett '26**

Psychology

Poster #3

**Eliana Choi '23**

Psychology

Poster #20

**Kylen Christiansen '23**

Sociology

Poster #26

**Ashley Compton '23**

Psychology

Poster #3

**Paige Freeburg '24**

Biology

Poster #16

**Esther Green '23**

Psychology

Poster #18

**Emma Hammond '23**

## ABSTRACTS

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### 1. **Examining Sclerite Size and Distribution in *Thesea*: Implications for Taxonomic Structure and Species Identification**

The genus *Thesea* comprises a group of gorgonian soft corals that play a crucial role in creating ecological stratification and refuges for a variety of marine creatures on an otherwise barren seafloor. However, due to their

## ABSTRACTS

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#### 4. **Investigations of Fetal Mortality and Injury Following a Motor Vehicle Accident**

Pregnant women involved in motor vehicle accidents (MVA) risk major injury to their fetuses. Studies show a high rate of fetal death and complications following even mild crashes. We performed a literature review of injury prevalence, impact of speed, injury mechanisms, and new seat belt designs. We then categorize the evolution of research focus and seatbelt options and directly compare a fetus to expectant mother deaths across studies. We found

### 7. **The Effects of Religious Priming on Gratitude to God**

This study seeks to better understand the effect of religious priming on gratitude to God.

Religiosity was explicitly primed by reading 9 Bible verses, this priming was the independent variable. The control condition received no priming. The Religious Gratitude Scale (Krause & Hayward, 2015) was used to measure feelings of gratitude to God. All participants indicated their religious affiliation and completed 2 questionnaires to assess their religious commitment: The Duke University Religion Index (DUREL) (Koeing & Bussing, 2010) and The Religious Commitment Inventory (King & Hunt, 1969). It is expected that those in the religious prime group will report greater feelings of gratitude toward God. The results are expected to be stronger among individuals who believe



## **ABSTRACTS**

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- 12. “Real Adventure”, Real Environmental Crisis: A Content Analysis of Patagonia Catalogs Over the Years**



**14b. The Effect of Alcohol on Cognition in Patients with Parkinson's Disease**

While there does seem to be a negative effect of alcohol consumption on the motor symptoms of Parkinson's disease (PD), there is limited research on the specific features of cognition affected among patients who consume alcohol and are diagnosed with PD. A total of 141 patients diagnosed with PD participated in neuropsychological assessment and reported their weekly alcohol intake. Those with PD who consume alcohol, even occasionally, performed significantly worse on frontal executive tasks,  $ps < .03$ , and had weaker scores on visuospatial tests,  $ps < .05$ , than those not consuming any alcohol. These findings suggest any alcohol use may have a negative impact

**17. The Effects of Physical Exercise on Mind Wandering and ADHD**

Psychology 23

Research on physical exercise indicates it is beneficial to emotional, mental, and physical health. The main goal of this study was to examine whether physical exercise, suggested enhancing self-regulatory function, would help reduce mind-wandering phenomena and attention-deficit/hyperactivity disorder (ADHD) symptoms. We recruited participants from the physical education elective course named fit for life. In the course, students performed equivalent physical exercise training required by the course instructor approximately three times per week over the course of 8 weeks. Participants completed a cognitive task that assessed their mind-wandering and a self-reported ADHD scale before and after the 8 weeks of exercise training. We hypothesized that after 8-weeks of physical exercise training, participants would show (1) a reduction in mind-wandering phenomena, and (2) reduced scores on ADHD self-report assessments.

Psychology  
Dr. Gewnhi Park

**18. Non-Invasive Vagal Nerve Stimulation via the Feelzing Patch and Memory**

Psychology 23

The goal of the study was to examine the effect of non-invasive vagal nerve stimulation methods on memory including false memory. Participants were randomly assigned to the vagal stimulation condition and the control condition. We used the Feelzing energy patch, a patch placed behind the ear, to stimulate nerves of the autonomic system including the vagus nerve. To examine the effect of vagal stimulation on memory, participants completed the Deese-Roediger-McDermott (DRM) paradigm. False memory would be evaluated by whether or not participants falsely remembered the lure words that were not previously presented during the study phase. It is hypothesized that participants with the non-invasive vagal nerve stimulation would have a higher recall and recognition of true memories compared to control participants not exposed to vagal stimulation. In addition, participants with the Feelzing patch would recall and recognize less false memories.

Psychology  
Dr. Gewnhi Park

*Keywords: vagal, memory, stimulation, autonomic, nerve*

## ABSTRACTS

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### **19. Developing Ethical and Economic Justifications for Wealth and Welfare to Guide Public Policy**

This research aims to collect and evaluate philosophical and economic

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### **21. Perceptions, Experiences, and Hardships of Race at a Predominantly White, Elite, Christian Liberal Arts Institution**

Our qualitative, interview-based study analyzes the experiences of 24 students who attend a predominantly white Christian college on the west coast. Past research has shown that people of color continue to experience racism today, and therefore we take an approach based on Critical Race Theory, structural racism and intersectionality. Our study expands on the experiences of these

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### 24. Westmont Biodiversity: Documenting Campus Fungi

The Westmont Biodiversity initiative ([www.westmontbiodiversity.com](http://www.westmontbiodiversity.com)) seeks to improve our understanding of the species that inhabit our campus. Additionally, we encourage engagement with these species through artistic expression, such as poetry and visual art. We also aim to serve as a resource for students who are pursuing independent projects or research related to the local ecosystem. By fostering greater awareness of the biodiversity present on campus, we hope to inspire continued study and protection of our environment. Our goal for this research project was to document fungi that could be included in our online database of organisms. We were able to identify 9 species in 9 genera and 7 families. We also found 15 unidentified species. In the future, to increase our number of identified species we plan to note the characteristics of the underside, gills, spore color, stem, presence or absence of a ring, smell, and habitat.

Abstracts 24

Abstracts 23

Biology

Dr. Amanda Sparkman

### 25. Interacting Python Program for General Physics Lab Students

Beginning in the second year of the Physics program, students use Python in their upper-division courses to analyze and interpret data, and perform mathematical procedures. To strengthen computational fluency within the Physics department, we sought to facilitate an experience that introduced students to Python to perform analyses on their data. General physics laboratories are great courses to begin to implement these methods. We created interactive Jupyter notebooks that introduced certain topics to students and how they relate to Python such as uncertainty propagation, introduction to the matplotlib package, and applying non-linear fits to graphs. This not only prepares students to succeed in their major-content courses but gives them a valuable tool to use in their future research projects.

Abstracts 24

Abstracts 24

Physics

Dr. Ben Carlson

### 26. Student Faith Experiences at Westmont

At Christian colleges, students experience a wide variety of faith integration in various Sectors of academics and social life. This study investigates the role of different factors which personally impact a student's faith over a 4-year trajectory while attending Westmont. In this study I address two primary research questions, 1. How does Westmont inform campus-wide norms of Christian faith within their student body what impact does this have on a student's personal faith? 2. How do relational experiences at Westmont influence a student's faith? I answer these questions based on 15 semi-structured, in-depth interviews. Each respondent additionally completed a short demographic survey. Analysis of data was completed using transcription, coding, visual mapping, and memos. Factors which were found to impact student faith development include chapel, classes (within and outside of major), peers, mentors, and various external religious experiences.

Abstracts 23

Sociology

Dr. Blake Kent

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### 27. The Effects of HRV on Gender and Cognitive Functioning

Previous research reported that when affective moods were elevated, working memory capacity decreased in men (Ozawa et al., 2014). This study examined gender differences in working memory when emotionally negative and neutral stimuli were presented prior to a working memory task. Furthermore, we examined the role that heart rate variability (HRV) played. We replicated the previous finding showing that participants would show impaired performance (e.g., slower reaction times or less accuracy) on a working memory task after emotionally negative distractors were presented. We hypothesized that this pattern would be more pronounced in women than men. Furthermore, we hypothesized that the impact of emotionally negative stimuli on working memory would be greater in people with lower resting HRV, indicating reduced self-regulatory function. Twenty male and twenty female college students were recruited to complete this study. The findings help us to better understand gender differences in the impact of emotion on working memory and the physiological correlates involved.

Psychology 23

Psychology  
Dr. Gewnhi Park

### 28. The Importance of Order in the Epitaxial Growth of Biphenyl Overlayer

The degree of ordering in the underlayer that is necessary to cause epitaxial growth of a biphenyl overlayer by vapor deposition is reported. In this study, two cyclic molecules, cyclohexane and benzene were used as underlayer to observe potential epitaxial growth of a biphenyl overlayer. Although both cyclohexane and benzene do form ordered crystals, cyclohexane undergoes a phase change to a glass just below its desorption temperature on Al<sub>2</sub>O<sub>3</sub> and this disorder does not allow epitaxial growth of biphenyl. In a similar way, benzene forms strong benzene-biphenyl 1:1 excited state complexes via van der Waals interaction that negates any potential epitaxial ordering of the biphenyl adlayer.

Chemistry 2  
Chemistry 2

## READINGS IN WINTER HALL 216

### Original Fiction And Poetry Selections From English Capstone

Sydney Abraham, 2023 English

Caleb Beeghly, 2023 English

Luke Spicer, 2023 English

Margaret Taylor, 2023 English & Political Science

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