



# Whiteness in Physics: A Discussion

**Group 3:** Katie Gifford, Grace Garmire, Jose Fajardo-Montenegro, Ibrahim Elsharkawy, and Jason Elhaderi

Robertson, A. D., & Hairston, W. T. (2022). *Physical Review Physics Education Research*, 18(1), 010119.

Reichhardt, C., Small, A., Nisoli, C., & Reichhardt, C. J. O. (2023). *arXiv preprint arXiv:2303.09434*.

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# Defining Whiteness:

Important  
Background



# Author's definition of “whiteness”

- Whiteness is a form of social organization that produces a **center** and **margins**
- Perpetuates **race-based differential outcomes**
- **Normalizes** white understandings and perspectives
- **Obscures** the action of whiteness as a social force



<https://www.insidehighered.com/news/2022/11/09/>



## Q: Who participates in whiteness?



### A: You, me, all of us.

- Whiteness is defined in terms of processes which perpetuate dominance, control, and the creation of transcendent figures which are valued above others.
- Defined in contrast to social organizations based on plurality, mutuality, and community care.
- Actors **need not be white** in order to participate in whiteness.

# How to make whiteness visible?



- Social life resembles a **center with margins**.
- **Race evasive framings** used based on meritocratic language.
- **Constraints on individual agency** to engage in mutual support.
- **Mechanisms of control** enforce the center.
- **Differential outcomes** occur which mapping onto racialized, gendered, or classed identities.

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# Observing Whiteness in Introductory Physics: A Case Study





# Introduction: Observing Whiteness in Introductory Physics: A Case Study

- The Authors:



**Amy D. Robertson**  
Professor of Physics  
at Seattle Pacific  
University



**W. Tali Hairston**  
Ph.D in Education at  
Seattle Pacific  
University

- The **objective** is to **identify and analyze** the reproduction of **whiteness**
  - In an introductory physics classroom
  - Using Critical Whiteness Studies and Critical Race Theory
- The hope is to address the **systemic nature of racism and white supremacy** in physics education

# Research Methods: Observing Whiteness in Introductory Physics: A Case Study

- The Approach:
  - A Case Study Analysis
    - Studying a video of a specific case
    - Then Interviewing Participants in a “**Stimulated Recall**”
    - This is a tradition in Critical Whiteness Studies.
  - There study employed a “**Interaction analysis**” choosing to focus on:
    - Discourse
    - Gesture
    - Gaze

# Research Methods: Observing Whiteness in Introductory Physics: A Case Study

- Methodology Goal:

- To find signs of whiteness in the interaction
  - Potentially allowing for general claims about physics education
- To build tools for instructors and other researchers that identify whiteness

- The Specifics:

- The Authors study *one six-minute video* case of
  - A discussion section in an introductory physics course
  - At a large public institution in the Western United States
  - With Three Students and an instructor.

Drake



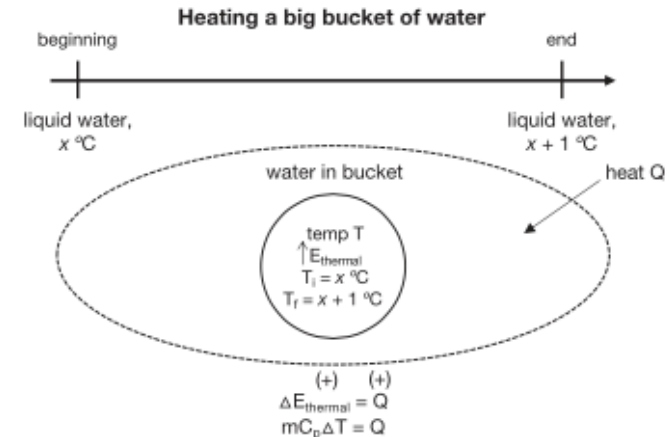
Paris

Gail

# Findings: Observing Whiteness in Introductory Physics: A Case Study



- **Key Observation:**
  - The activities of the classroom centered around:
    - **One student (Drake)**
    - **The representation he constructed**
      - **Energy Interaction Diagram (EID)**

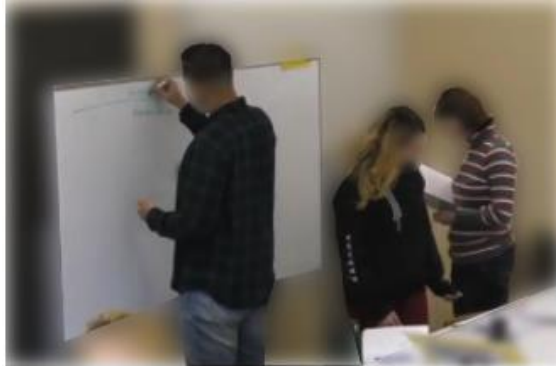


# Findings: Observing Whiteness in Introductory Physics: A Case Study

- **Impact on Other Students:**

- The attention of Paris and Gail was divided:
  - Focusing on Drake's work
  - Simultaneously engaging in their own sense-making

The Center



The Margin

- **Observation of the Instructor:**

- The instructor's attention was **predominantly directed** to Drake
- **Little amplification** of Paris and Gail's contributions

# **Conclusion:** Observing Whiteness in Introductory Physics: A Case Study

- **Main Conclusion:**

- “Whiteness”, as a **social organization**, shapes interactions and attention in physics classrooms. This is to say:
  - Certain behaviors and representations were given central importance
  - Other perspectives and forms of engagement were marginalized

- **Implications:**

- The authors call for a reevaluation of classroom dynamics and teaching practices
  - Recognizing patterns of whiteness is a prerequisite to disrupting them
  - This may foster more inclusive educational environments

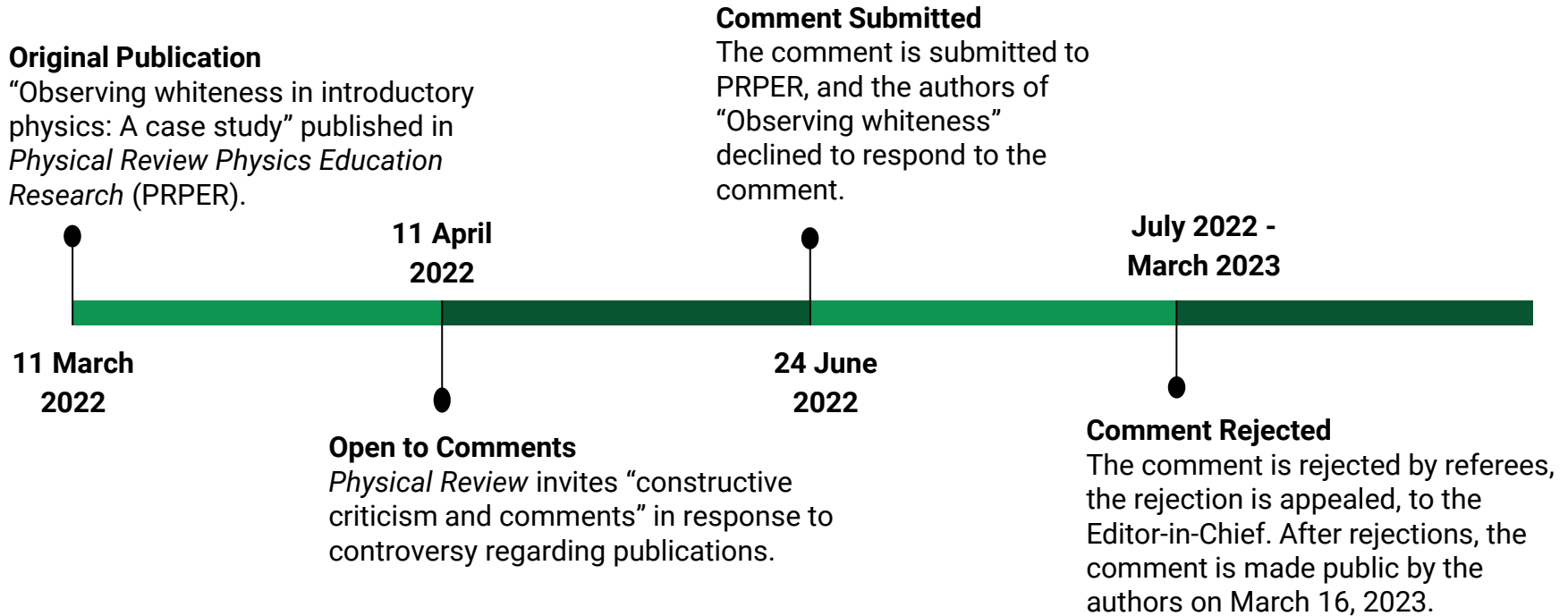


A short horizontal bar with a teal segment on the left and an orange segment on the right.

# Comment on “Observing whiteness in introductory physics: A case study”

made public on arXiv

# Publication Timeline





# Overview of the Comment



- responds to “Observing whiteness,” arguing that the study **lacks proper controls, checks, and consistent methodology to be repeated**
  - “framework is completely incompatible with quantitative and qualitative scientific studies.”
- Original paper states that “physics as an epistemology is not well-suited to assess arguments of the kind [they] have made”; the comment interprets that the method of research used cannot be evaluated by scientific methods

The comment argues that **this statement is a “bad faith” argument** in that no critique of the original work is allowed.

## Aside: Good Faith Argumentation

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- “good faith” argumentation: both parties go with the **intention of having a productive dialog**
  - parties genuinely want to hear and learn from each other
- “Bad faith” argumentation involves a **hidden agenda** from one or both parties
  - may rely on means other than pure persuasion to hold up the argument

The original paper, “Observing Whiteness,” says that dismissal of their argument based on a critique of qualitative analysis is engaging in bad faith argumentation.

The comment interprets this as a statement that any critique of the original authors is in bad faith.

# Key arguments of the Comment

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- The original study **lacks proper data**
  - The first study evaluates one video interaction
- There is a lack of evidence for the **reliability of the method**
  - few controls in the study, no method for ensuring that different viewers of the video would have similar conclusions
- There is **no method of disconfirmation**
  - Cannot confirm results or apply the same analysis to other cases

The comment admits that “many of [their] suggestions involve increasing the level of quantitiveness of the study”, calling physics a quantitative science.

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# Discussion of Perspectives: A Debate



# Is the methodology used by the authors of “Observing whiteness” valid?

## Yes

- Case studies in PER are utilized to develop and refine theories, through extensive detailing of the existence of a phenomenon.
- Selecting data will be influenced by the researchers framing (i.e. CWS).

## No

- Alternative interpretations should be considered.
- Recommendations for physics courses are not directly linked to the outcomes of the study.

# Does the “Observing Whiteness” paper succeed in demonstrating the presence of whiteness as a social construct

## Yes

- Documentation of how power dynamics/structures influenced interactions within a physics course
  - e.g.: EID, school structure, whiteboards
- Results and conclusions are informed by their theoretical framework (CWS).

## No

- Proof that the power structure *is* whiteness hinges on the reader’s belief in CWS as a valid theory.
- Authors do not utilize alternative theoretical considerations and explanations of results.

# To what extent does *the comment* participate in good/bad faith argumentation?

## Good Faith

- Theories other than CWS could be used to explain the power dynamics that occurred.
- Authors could independently analyze data, then collaborate to refine interpretations.

## Bad Faith

- “The Comment” fails to understand qualitative methods.
  - “The work...lacks sufficient data to give any type of statistical reliability estimate”
- Focusing on the use of CWS to oppose the existence of power dynamics

# Did APS fairly reject “The Comment”?



## Yes

- Criticisms in the comment display unfamiliarity with norms of PER research.

## No

- The means for scientific discourse, which APS clearly outlined, was blocked.
- Valid points are made regarding the consideration of alternative explanations.



# (some of) Our Thoughts



- “The **authors of the comment** have fundamentally **different axioms** than those of the original paper, and I don’t think they realize it.”
- “Although ‘Whiteness’ is a misnomer for the manifestation of power observed, the paper points out serious issues that should be addressed.”
- “The choice to “**defend against**” possible future criticism from the general physics community, **presumes that a non-PER audience will engage** with this paper which is misaligned with the presentation of their methods”.
- “The original paper slightly overuses the results of the case study, the **comment unfairly dismisses the entire argument** based on a disagreement in research technique in a bad-faith argument”
- “Although the authors identify a problem in physics education, they potentially fail to **truly establish that this is an instance of “Whiteness”**.”
  - Giving problems an **underserved racial context** can **undermine truly racial issues**.



# Citations and Impact: Building Context



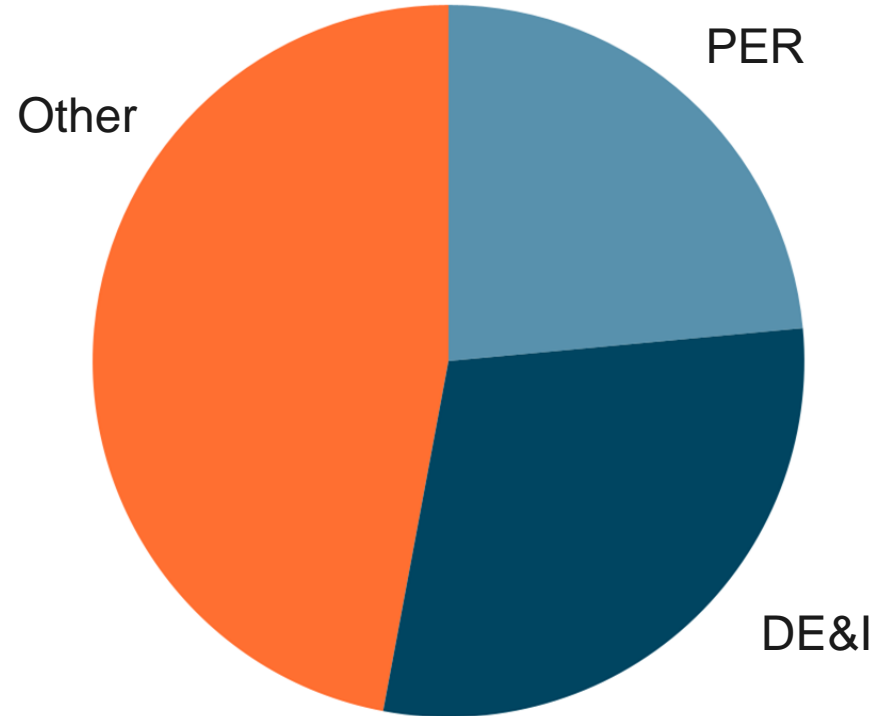
# Impact

“Observing whiteness in introductory physics: A case study”

- 21 citations according Google Scholar.

“Comment on ‘Observing whiteness in introductory physics: A case study’”

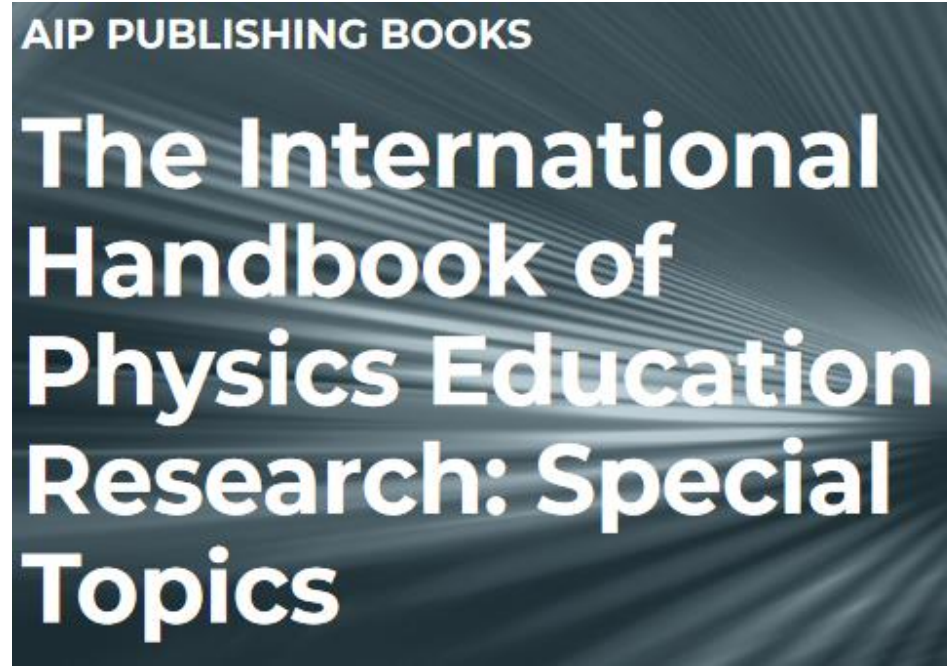
- 1 (self-)citation according Google Scholar.



# What studies came after “Observing whiteness...?”

PER related:

“The unsettled state means that we can and should expect, welcome, and engage with **diverse ideas**, including those that depart from the ‘truths’ that seem like obvious common sense.”



# What studies came after “Observing whiteness...?”

DE&I related:

“Two Black queer STEM students’ counter-stories highlight how uncertainty about faculty bias, lack of identity-conscious support, and stereotypes of ability shaped intersectional oppression in introductory physics courses.”

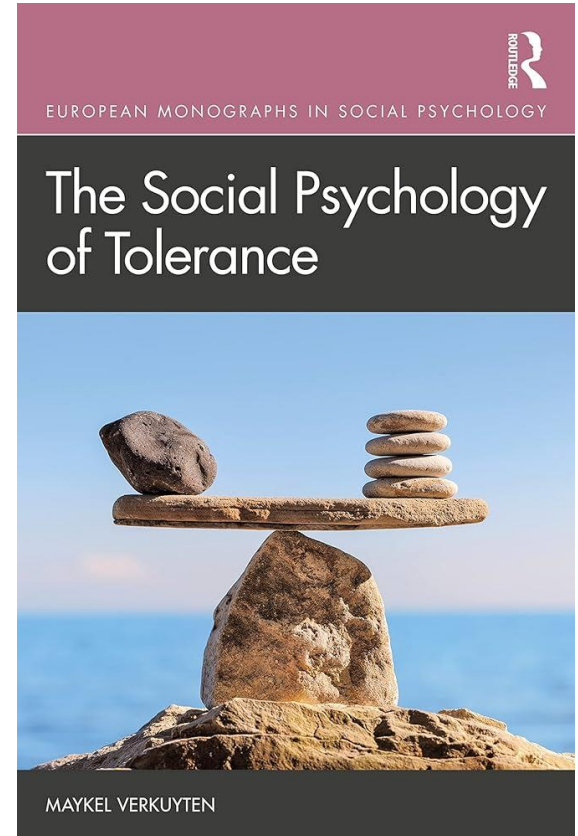
Leyva, L. A. (2022, September). In *2022 Physics Education Research Conference (PERC) Proceedings*. <https://doi.org/10.1119/perc>.



# What studies came after “Observing whiteness...?”

## Miscellaneous:

- Verkuyten, M. (2022). ***The social psychology of tolerance***. Taylor & Francis.
- Hatcher, B. (2023). **Decolonizing health policy and practice: Vaccine hesitancy in the United States**. *Nursing Philosophy*, 24(2), e12428.
- Ridgley, S. K. (2023). ***Brutal Minds: The Dark World of Left-wing Brainwashing in Our Universities***. Humanix Books.



# What studies came after “Observing whiteness...?”

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## Resistance to Critiques in the Academic Literature: An Example from Physics Education Research

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CHARLES REICHHARDT\*, ALEX SMALL\*\*, CRISTIANO  
NISOLI\* & CYNTHIA REICHHARDT\*

\*Los Alamos National Laboratory, Los Alamos, New Mexico, USA. Email [cjrx@lanl.gov](mailto:cjrx@lanl.gov)

\*\*California State Polytechnic University, Pomona, California, USA



# Questions?

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