

Introduction

• First Person Shooter Task (Correll, Park, & Judd, 2002)

- Armed Targets - "Shoot" response
- Unarmed Targets - "Don't Shoot" response



• Participants can employ two mechanisms of cognitive control to mitigate the bias (Braver, 2012).

- Proactive Control- sustained, preparatory attentional bias
- Reactive Control- late, stimulus-based attentional control

• Decreasing the need to use cognitive control will make using that control harder (Bugg, 2014).

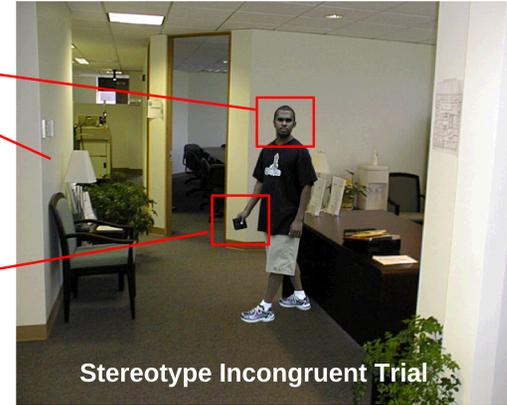
• **Hypotheses:**

- Increasing proportion of stereotype congruent trials will lead to poorer performance in stereotype incongruent trials
- Working memory and cognitive control interact to mitigate shooter bias

Cognitive Control in the Shooter Task

Information to ignore:
Racial identity of target
Surrounding environment

Information to attend:
Identity of object being held



Important to ignore irrelevant information?

Stereotype Incongruent
YES

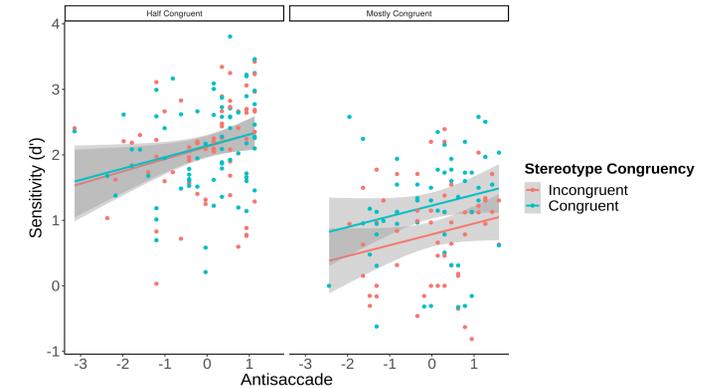
Stereotype Congruent
NO

Reducing number of Stereotype Congruent trials will reduce overall need for attentional control

Reducing overall need for control will make people less likely to use control when it is needed

Results

Does working memory play a role in bias?



Stereotype Congruency X Experiment interaction, $\beta = 0.11, p < .001$
Higher Antisaccade measures associated with better gun detection; other working memory components show no relationship

• **Linear Mixed Effect** models used to model Accuracy and RT
- Fixed effects: Race, Gun, Study
- Random effects: Stimulus Environment, Participant

• **Linear Mixed Effect** model used to model Sensitivity (d')
- Fixed effects: Stereotype Congruency, Gun
- Random effects: Participant

Method

• **First-Person Shooter Task**

Half Congruent

24 Black Unarmed
24 Black Armed
24 White Unarmed
24 White Armed

Mostly Congruent

18 Black Unarmed
72 Black Armed
18 White Unarmed
72 White Armed

• Analyzed 18 trials per condition in Mostly Congruent study

Working Memory Tasks

• **Automated Running Span** (Broadway & Engle, 2010)

- A random string of 4-9 letters is presented; participants recall 3-6 of those letters

• **Backwards Digit Span** (Unsworth & Engle, 2007)

- A random string of 2-8 numbers is presented; participants recall the string in reverse order

• **Automated Symmetry Span** (Unsworth et al., 2005)

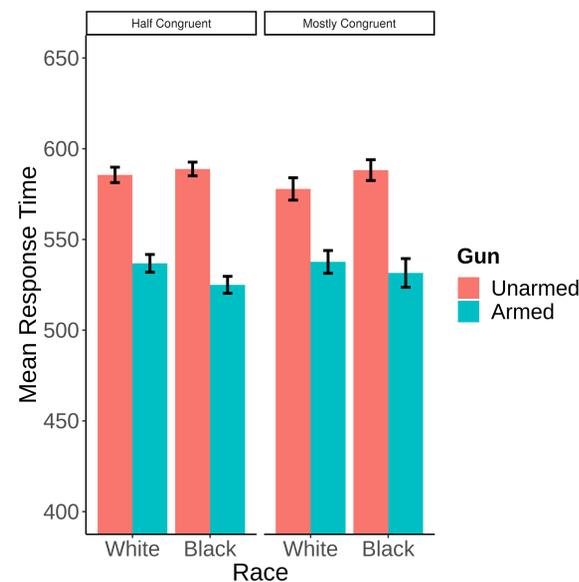
- A random string of 2-5 to be remembered letters is presented; a symmetry judgment is made on images between each letter presentation

• **Antisaccade Task** (Kane et al., 2001)

- A briefly presented (50 ms) target letter must be identified on one side of the screen as a flashing stimulus is presented on the other side of the screen

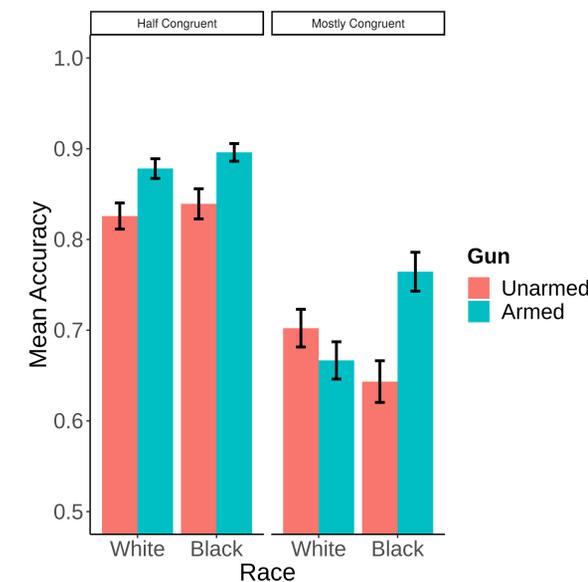
Results

Does stereotype congruency proportion affect shooter performance?



Race X Gun, $\beta = -3.81, p < .001$ (Half Congruent)
Race X Gun, $\beta = -5.79, p < .001$ (Mostly Congruent)

Within each study, Black armed targets were shot faster than Black unarmed targets; this bias to shoot was not as large for White targets. No evidence for an effect of congruency proportion was found.



Race X Gun X Study interaction, $\beta = 0.12, p < .001$

Participants were more accurate at shooting Black targets when compared to White targets; this high accuracy was better preserved in the Mostly Congruent study.

Discussion

Proactive Cognitive Control

Important for mitigating shooter bias

Study where proactive control was less likely to be used showed worse bias

Effects accuracy more than response time

Especially true for Black Stereotype Incongruent trials - showed larger accuracy decrease between experiments than White Stereotype Incongruent trials

Working Memory

No current evidence for mitigating shooter bias

Capacity components of working memory showed no relationship to racial stereotype congruency; attention control component showed promise (marginal Incorrect RT x Study interaction, $p = .06$)

Future Studies: more in-depth proactive control manipulation; multiple measurements for each working memory component

References and Acknowledgments

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