

Why Does the World Seem Whiter than it is: Examining Racial Bias Using a VSTM Task



Guadalupe D.S. Gonzalez, B.A., David M. Schnyer, Ph.D
The University of Texas at Austin



Introduction

- Investigating the neurocognitive mechanisms underlying racial bias is important for understanding how racial stereotypes and prejudice develop.
- Neurocognitive research has focused on the effects of racial bias on cognitive processes (e.g. memory).
 - Cross-Race Effect (CRE) – better recognition/memory for own-race (OR) faces than cross-race (CR) faces³
- Implicit racial bias affects basic neurocognitive processes including visual working memory (VWM).⁶
 - Individuals with higher prejudice (as evidenced by IAT) encode Black faces with lower precision than individuals with lower prejudice
 - No competition for attention – during task, participants attended to only one race at once (Black or White)
- Question: In face of competition for attention, how does race affect working memory (WM)?

EXPERIMENT 1

Methods

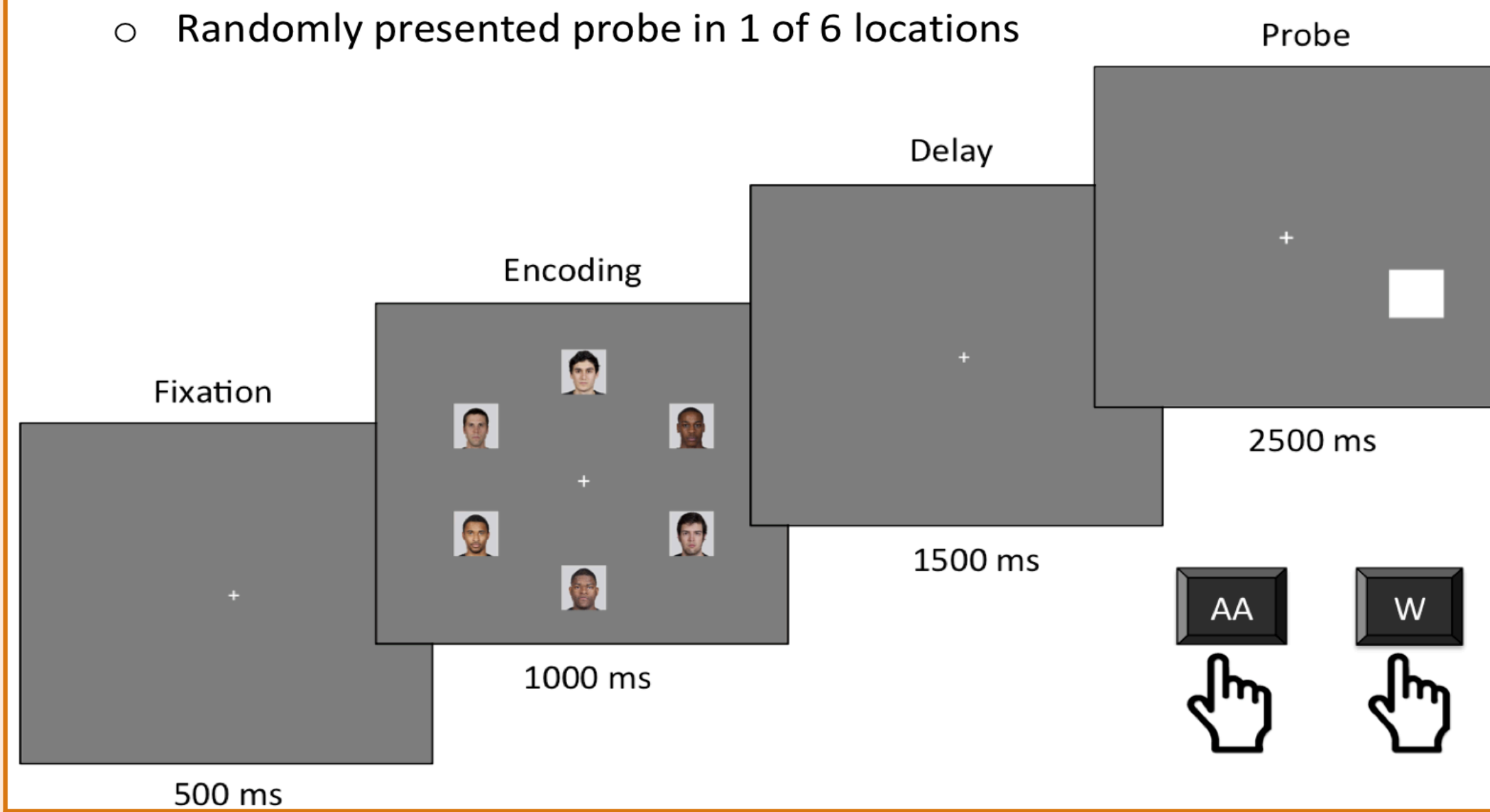
Participants

- 30 undergraduate students at UT Austin
 - 1 participant excluded due to experimental compliance
- 20 female, 10 male, (*mean age = 19.7, SD = 1.13*)

Procedure

Visual Short-Term Memory (VSTM) Paradigm⁸

- Stimuli: Multi-Racial Mega-Resolution database (MR2)⁷
 - 10 White & 10 Black faces
 - 10 male & 10 female faces for each race
- 10 practice trials
- 4 blocks: 2 male faces, 2 female faces (counterbalanced)
 - 60 trials/block
 - Encoding: 6 randomly presented faces (3 Black & 3 White)
 - Randomly presented probe in 1 of 6 locations



Health & Demographics Questionnaire

- Demographic questions (e.g. age, gender, race/ethnicity)
- Health questions (e.g. exercise, health problems)

Symbolic Racism 2000 Scale (SR2KS)¹

- It's really a matter of some people not trying hard enough; if blacks would only try harder they could be just as well off as whites.
 - Strongly agree
 - Somewhat agree
 - Somewhat disagree
 - Strongly disagree
- Irish, Italian, Jewish, and many other minorities overcame prejudice and worked their way up. Blacks should do the same.
 - Strongly agree
 - Somewhat agree
 - Somewhat disagree
 - Strongly disagree
- Some say that black leaders have been trying to push too fast. Others feel that they haven't pushed fast enough. What do you think?
 - Trying to push very much too fast
 - Going too slowly
 - Moving at about the right speed

Procedure (continued)

Color-Blind Racial Attitudes Scale (CoBRAS)⁵

- 3 subscales:
 - Racial Privilege (RP) - 7 items
 - Institutional Discrimination (ID) - 7 items
 - Blatant Racial Issues (BRI) - 6 items
- Higher scores = Higher racial prejudice

It is important that people begin to think of themselves as American and not African American, Mexican American or Italian American.

Due to racial discrimination, programs such as affirmative action are necessary to help create equality.

Racism is a major problem in the U.S.

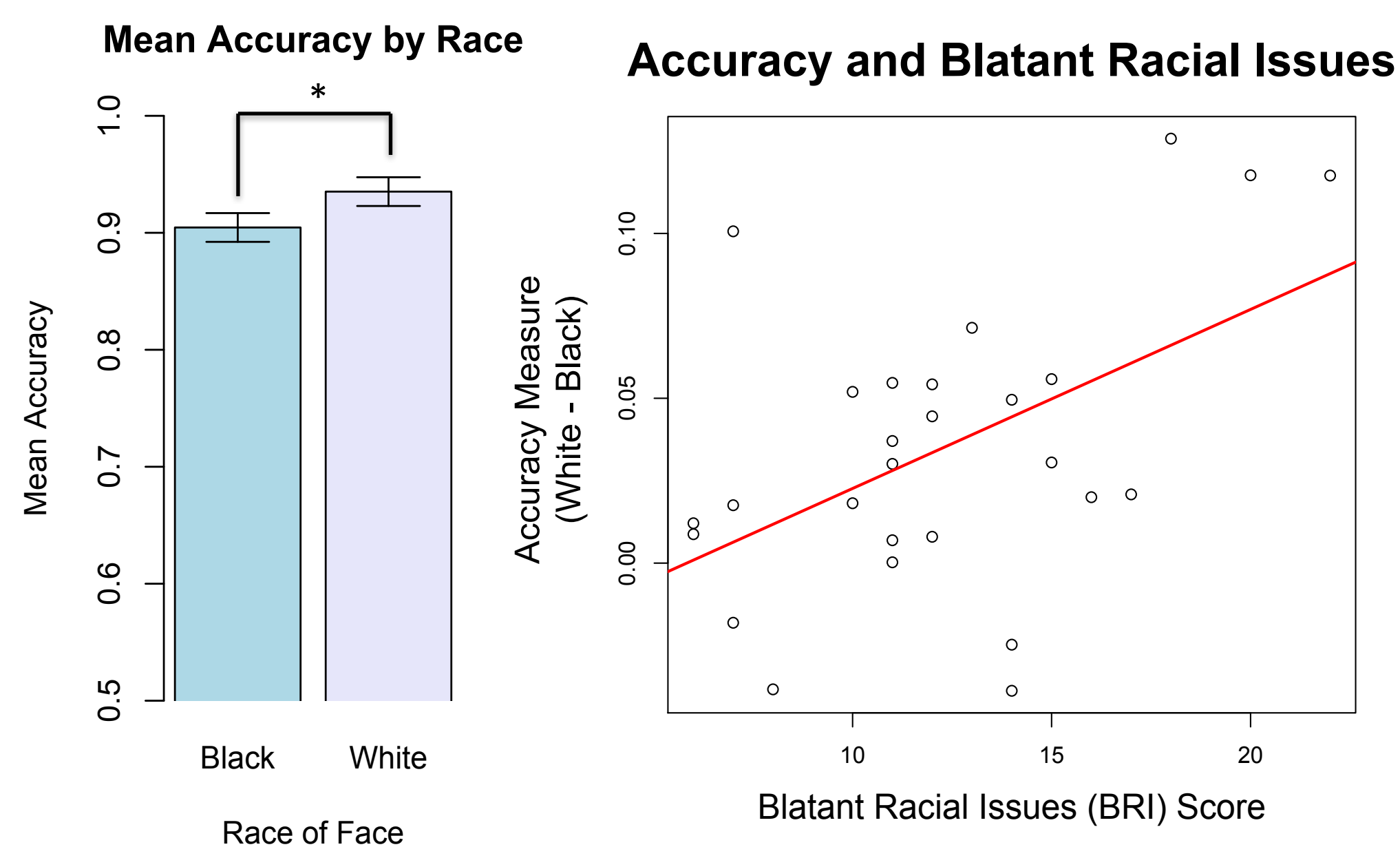
1 - Strongly Disagree
 2
 3
 4
 5
 6 - Strongly Agree

Data Preprocessing

- Excluded:
 - Incorrect trials
 - Trials with false starts (Reaction Times (RTs) < 300 ms)
 - Trials with long RTs (RTs > 2.5 SDs from mean)

Results

- WM advantage: Greater accuracy for White faces than Black faces ($t(28) = -3.613, p < .001$)
- Positive correlation between accuracy measure and BRI subscale of the CoBRAS ($r = .503, p = 0.01, n = 27$) (2 participants excluded due to missing data)
 - Greater accuracy differences (White faces – Black faces) associated with more colorblind racial attitudes (prejudice)



EXPERIMENT 2

Goal:

- Replicate results from Experiment 1 and investigate whether the magnitude of the CRE is greater in Whites
 - Evidence suggests that the magnitude of the CRE is greater in Whites⁴, perhaps the CRE found in Experiment 1 was moderated by the racial diversity of participants.

Methods

Participants

- 51 White undergraduate students at UT Austin
 - 2 excluded due to experimental compliance and 1 excluded due to data recording problems
- 39 female, 10 male, (*mean age = 19.7, SD = 4.43*)

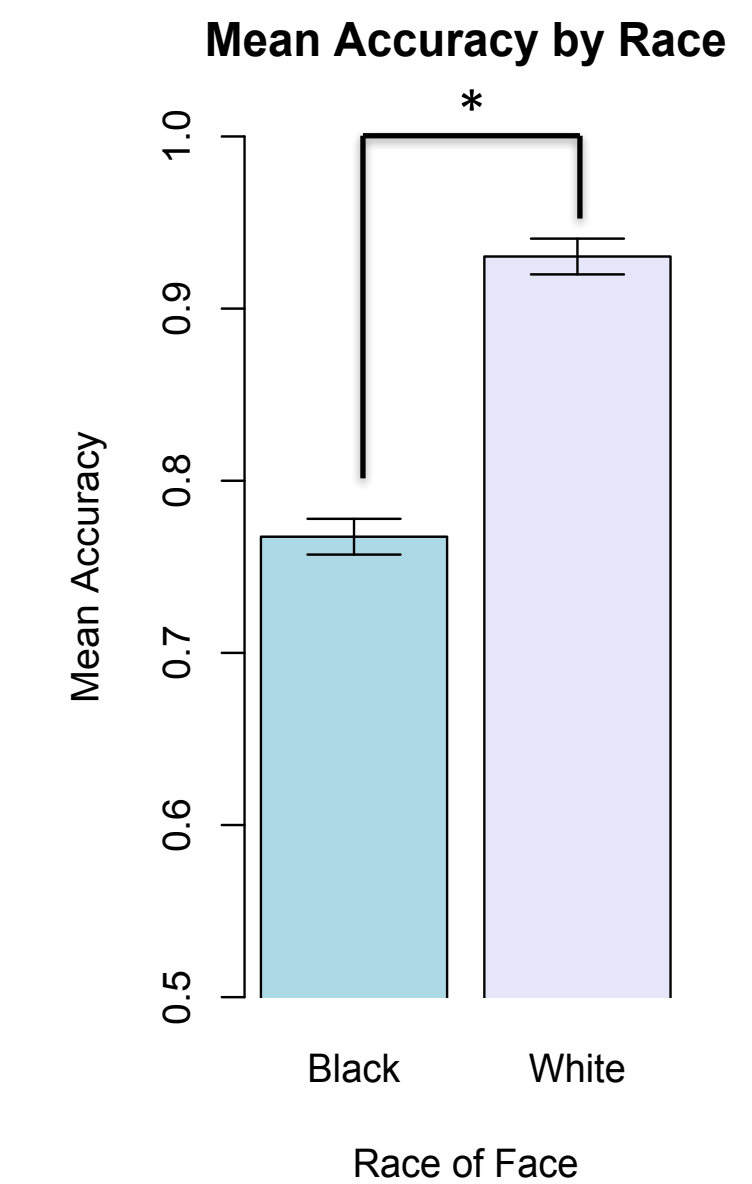
Procedure

- Racial VSTM Task (Image Cue)
- CES-D
- Racial VSTM Task (Square Cue)
- Health & Demographic Questionnaire, SR2KS, & CoBRAS

Data Preprocessing was the same as Experiment 1

Results

- WM advantage: Greater accuracy for White faces than Black faces ($t(46) = -22.297, p < .0001$)
- No correlation between accuracy measure and CoBRAS subscales



Discussion

- Experiment 1: Participants who were more racially prejudiced on the BRI showed a greater racial advantage.
 - Larger differences in accuracy associated with higher scores in the BRI subscale of the CoBRAS
- Experiment 2: A greater CRE was observed in White participants, but it was not correlated to the BRI scores.
 - Greater range of BRI scores for Experiment 2 (*Mean = 13.85, SD = 5.25, Range = 22*) than Experiment 1 (*Mean = 12.22, SD = 4.14, Range = 16*)
- Under competition for attention, race affects basic cognitive mechanisms (e.g., VWM)
 - White faces better remembered than Black faces and this VWM advantage was greater in White participants
- Perhaps CRE is due to selection of race-specific information during encoding of CR faces.³
- Differences in configural versus featural processing between OR and CR faces.²
- Priority mapping – individuals attend to what is important to them (“White World”)
 - Same-race faces more rewarding

Future Research

- Neurocognitive mechanisms underlying CRE
 - ERP study – neural correlates of CRE
- Social mechanisms underlying CRE
 - Familiarity & perceptual expertise measures

References

- Henry, P. J., Sears, D. O., Psychology, P., Jun, N., & Sears, D. (2002). The Symbolic Racism 2000 Scale. *Political Psychology*, 23(2), 253–283.
- Ho, M. R., & Pezdek, K. (2016). Postencoding cognitive processes in the cross-race effect: Categorization and individuation during face recognition. *Psychonomic Bulletin & Review*, 23(3), 771–780.
- Levin, D. T. (2000). Race as a visual feature: Using visual search and perceptual discrimination tasks to understand face categories and the cross-race recognition deficit. *Journal of Experimental Psychology: General*, 129(4), 559–574.
- Meissner, C. A., & Brigham, J. C. (2001). Thirty years of investigating the own-race bias in memory for faces: A meta-analytic review. *Psychology, Public Policy, and Law*, 7(1), 3–35.
- Neville, H. a., Lilly, R. L., Duran, G., Lee, R. M., & Browne, L. (2000). Construction and initial validation of the Color-Blind Racial Attitudes Scale (CoBRAS). *Journal of Counseling Psychology*, 47(1), 59–70.
- Sessa, P., Tomelleri, S., Luria, R., Castelli, L., Reynolds, M., & Dell'Acqua, R. (2012). Look out for strangers! Sustained neural activity during visual working memory maintenance of other-race faces is modulated by implicit racial prejudice. *Social Cognitive and Affective Neuroscience*, 7(3), 314–321.
- Strohinger, N., Gray, K., Chituc, V., Heffner, J., Schein, C., & Heagins, T. B. (2015). The MR2: A multi-racial, mega-resolution database of facial stimuli. *Behavior Research Methods*, 48(3), 1197–1204.
- Wilken, P., & Ma, W. J. (2004). A detection theory account of change detection. *Journal of Vision*, 4(12), 11–11.

Acknowledgments

- Ford Foundation & 2016 Conference of Ford Fellows
- Cognitive Neuroscience Lab