Revealing how a videogame can change players' implicit racial biases

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Abstract: African American men are underrepresented among faculty in academic science, technology, engineering, mathematics, and medicine (STEMM). Implicit racial biases are one factor that may contribute to this underrepresentation. The current study examines whether a videogame can reduce implicit racial bias, inducing players to feel empathy for the game's protagonist, an African American graduate student named Jamal Davis. Participants in this randomized controlled study either played a game designed to reduce implicit bias (experimental condition) or read a narrative based on the game experience (control condition). In both conditions, the participants are asked to take on the role of Jamal; however, in the game, players actively get to play as this character. Participants' levels of perspective taking and empathy for Jamal, awareness and experience of bias, and implicit bias towards African Americans were compared to understand whether gameplay can lead to reductions in implicit racial bias.

Introduction & Context of the Study

African Americans make up thirteen percent of the U.S. Population (U.S. Census, 2010), but only four percent of faculty in science and engineering at all four year colleges and institutions (NSF, 2008) and only three percent of faculty at Research I institutions. There are numerous reasons for this underrepresentation. Popular explanations include: inadequate science, technology, engineering, mathematics and medicine (STEMM) exposure in K-12; negative peer pressure; low expectations from teachers; students' belief in stereotypes about what science is, what scientists do, and what kinds of people become scientists, (Quality Education for Minorities Network, 2010). Another factor that has been studied to a lesser extent is implicit racial bias of current STEMM faculty members.

Implicit biases are unconscious assumptions based on group stereotypes. Implicit racial bias is an unconscious tendency to prefer one race of individuals to another. Studies show that the majority of people in the U.S., including individuals in STEMM fields such as medicine (Green et al., 2007) and psychology (Boysen & Vogel, 2008), unconsciously prefer White individuals to Black individuals (see also Nosek et al., 2007; Nosek, Banaji & Greenwald, 2002).

The majority of people in Western societies also have stronger implicit associations with men and science than with women and science (Nosek, Banaji, & Greenwald, 2002; Cvencek, Meltzoff, & Greenwald, 2010). In other words, most individuals hold the stereotype that most scientists are men. Studies have shown that when the majority of individuals in a given culture have high implicit biases against women in science, women have lower science and math achievement (Nosek et al., 2009). Thus, implicit biases, even though unintentional, can disadvantage individuals from negatively stereotyped groups.

Not a single study directly measures the impact of implicit racial bias in academia; however, numerous studies document the "chilly climate" and subtle racial discrimination that racial/ethnic minority faculty experience (e.g., Solorzano, Ceja, & Yosso, 2000; Peterson, Friedman, Ash, Franco, & Carr, 2004; Pololi, Cooper, & Carr, 2010; Singh, Robinson, & Williams-Green, 1995). While most individuals do not believe themselves to be racist, it is possible for explicitly non-prejudiced individuals, with the best intentions, to act on implicit racial biases (Devine, 1989).

In academic medicine, Black faculty are one third as likely to hold senior rank as White faculty, even after statistically controlling for department, medical school, years as faculty, number of peer-reviewed publications, receipt of research grant funding, proportion of time in clinical activities, sex, and tenure status (Palepu, Carr, Friedman, & Ash, 2000). Black STEMM faculty are also ten percent less likely than White faculty to receive a National Institutes of Health (NIH) R01 grant, even when controlling for demographic variables (e.g., race/ethnicity, gender, citizenship status), education and training (e.g., degree type, degree field, previous NIH training), employer characteristics (e.g., NIH funding rank, institution type, Carnegie Classification), NIH experience (e.g., previous NIH grant awards, NIH review committee member), and research productivity (e.g., publication quartiles, citation quartiles, impact factor of publications; Ginther, et al, 2011). On the website ratemyprofessors.com, Black male faculty are rated

more negatively by their students than all other faculty (Reid, 2010). Thus, it is possible that unconscious racial biases impact the careers of African American faculty.

Research has found that taking the cognitive perspective of an individual from a stigmatized group can reduce one's implicit bias. A recent study (Todd, Bodenhausen, Richeson, & Galinsky, 2011) found that implicit bias towards African American men was reduced when individuals attempted to take on the perspective of an African American man being discriminated against. Another study found that non-Muslim participants who simply imagined talking to a Muslim stranger showed decreased implicit bias towards Muslims (Turner & Crisp, 2010). One caveat to this work is that individuals are more likely to take the perspective of those believed to have similar personality characteristics and values (Krebs, 1975).

Typically, perspective-taking studies ask participants to read a narrative, or listen to an interview, and then imagine themselves as the individual. Yet, what if participants were able to actively take on the role of such an individual? Would this lead to improved results? Few studies have considered this type of "active perspective taking," however, one such study (Clore & Jeffery, 1972) asked a group of able-bodied college students to spend 25 minutes traveling around campus in a wheelchair. They asked another group of able-bodied students to follow them at a close distance. They found that both students who traveled in a wheelchair and those who followed them responded significantly more positively to a disabled person. Additionally, four months later, they were more likely to recommend increased university spending on facilities for disabled students. This study was conducted before the development of measures of implicit attitudes, such as the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). The current study asked participants to actively take on the role of a member of a stigmatized group, in this case an African American scientist, to determine whether spending a day in his life will lead them to take his perspective, and in turn, have decreased implicit bias against all African Americans.

Videogames are a unique medium in which players become immersed in virtual worlds that would otherwise be difficult to replicate (Gee, 2003). Players are active agents in these game environments, and interactions therein can result in memorable and personal experiences for the players (Squire, 2011). Player engagement is a key consideration in game design, and many designers strive to create worlds in which players will identify and empathize with the main character of the game (Schell, 2008). Good games allow players to merge their real-world identity with the identity of their game character, typically the protagonist.

Games allow for vast opportunities to role-play, thus, lending themselves to opportunities for active, or embodied perspective taking. Yee and Bailenson (2006) found that college students who actively took on the perspective of an elderly person in a virtual environment developed more empathy and positive attitudes towards the elderly than students who took on the perspective on a young person. The purpose of the current study is to examine whether playing a videogame in the role of a member of a stigmatized group will lead to greater reductions in implicit racial bias compared to simply imagining oneself in that role. To this end, we have designed a videogame in which players play a young African American graduate student named Jamal Davis. We conducted a randomized controlled study in which we compared playing Jamal in the videogame *Fair Play* (experimental condition) to reading a narrative description of the events in the game (control condition).

In *Fair Play*, we capitalize on players' projected identity (Gee, 2003) to create experiences where they can actively take on the role of Jamal. In the game, Jamal experiences subtle racial discrimination from his colleagues and, as the game goes on, players are encouraged to imagine themselves as Jamal and reflect on the impact of the non-player characters' (NPCs) implicit racial biases.

Methods

We collected data from 131 graduate students from STEMM departments at a large university in the Midwest. Participants were recruited to participate in the study via email invitation. The email included a link that randomly redirected participants to either the experimental or control condition.

The experimental condition contained the game described above, in which participants played the role of Jamal as he navigates through the world of academia. In the game, participants had the opportunity to experience implicit biases as Jamal, particularly in his encounters with other game characters and environment. The control condition contained an image of Jamal and a narrative of the experiences he encounters throughout the game, though this narrative does not allude to the game directly. Participants in both conditions were asked to "imagine (themselves) as Jamal." This phrase has been found to be a useful way to induce perspective taking in previous studies (e.g. Batson, Early, & Salvarani, 1997; Todd, Bodenhausen, Richeson, & Galinsky, 2011; Turner & Crisp, 2010).

Participants in both experimental and control groups were given the same seven outcome measures immediately after playing the game or reading the narrative. First, they took an Evaluative Race Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998), which quantified the strength of their implicit racial associations. Next, they completed a brief survey battery containing a measure of empathy (Batson, Early, & Salvarani, 1997; Batson, Polycarpou et al., 1997; Toi & Batson, 1982) and three questionnaires designed by our research team to measure: level of engagement in the exercise, degree of perspective taking, and awareness of racial bias that occurred in the exercise. Players also provided brief qualitative responses to questions about player identity and what they learned during the exercise. Finally, players answered demographic questions such as previous videogame experience, gender, age, and academic college or school.

Results

128 individuals completed all outcome measures. There were 70 (53%) participants in the control group and 58 (44%) in the experimental group. Forty-seven percent (N = 63) were male and forty-six percent (N = 62) were female (3 participants chose not to respond). Seventy-six percent (N = 99) identified as "White" and thirty-six percent identified as non-White (N = 47; 4 African Americans, 13 Latinos, 21 Asians, and 1 American Indian). Finally, twenty percent self-identified as gamers (N = 13) and seventy-nine percent identified as non-gamers (N = 103).

All scales had good internal consistency with the exception of perception of bias; Cronbach's alphas were: level of engagement scale (.821), perspective taking (.892), perception of bias (.521), and empathy (.951). As internal consistency for the perception of bias scale was poor, it was not used for further quantitative analyses. Due to the fact that the majority of participants identified as White/Caucasian, implicit bias is only reported for those individuals. With the exception of implicit bias, all scales had non-normal distributions, thus non-parametric statistics were used for the majority of analyses.

There was no significance in participants' level of implicit bias in the experimental (M = .30, SD = .33) versus control (M = .29, SD = .40, $t(96)$ = .13, p = .93) groups. However, participants in both conditions had lower levels of implicit bias than the survey data would suggest. Nosek et al. (2007) found that individuals across the country have higher implicit bias scores than participants of our study (M = .37, SD = .43). Sabin, Nosek, Greenwald, and Rivera (2009) found slightly higher levels of implicit bias among individuals with doctorates than our sample (M = .32, SD = .45).

Mann Whitney U tests revealed no significant differences in engagement (experimental Md = 10.0, n = 58; control Md = 10.0, n = 69; U = 1984, z = -.080, p = .94), or perspective taking (experimental Md = 16.0, n = 58; control Md = 17.0, n = 68; U = 1748, z = -1.11, p = .267). Level of empathy for Jamal was significantly different for the experimental (Md = 19.5, n = 56) and control conditions (Md = 28, n = 63; U = 1209, z = -2.96, p = .003, r = -.27), with participants in the control condition (website) reporting more empathy for Jamal.

A one way between groups multivariate analysis of variance was performed to investigate sex differences in identification with Jamal. Two dependent variables were used: perspective taking and empathy. The independent variable was gender. There was a statistically significant difference between males and females on those combined variables ($F_{(2,118)}$ = 9.79, p = .000; Wilks' Lambda = .86; partial eta squared = .14). When considered separately, there were significant differences in perspective taking ($F_{(1,121)}$ = 17.59, p = .000, partial eta squared = .13) and empathy ($F_{(1,121)}$ = 9.53, p = .003, partial eta squared = .074). An inspection of the mean scores indicated that females (M = 17.22, SD = 2.67) reported more perspective taking than males (M = 14,63, SD = 3.96). Females (M = 26.3, SD = 10.39) also reported more empathy for Jamal than males (M = 20.59, SD = 9.97).

A separate one way between groups multivariate analysis of variance was performed to investigate race/ethnicity differences in identification with Jamal. Two dependent variables were used: perspective taking and empathy. The independent variable was race/ethnicity. There was a statistically significant difference between individuals who identified their race as White compared to those who identified as non-White ($F_{(2,188)}$ = 4.22, p = .017; Wilk's Lambda = .93; partial eta squared = .07). When results for the dependent variables were considered separately, only empathy was statistically significant ($F_{(2,119)}$ = 8.11; p = .005; partial eta squared = .07). An inspection of the mean scores indicated that White participants reported more empathy for Jamal (M = 24.70, SD = 10.31) than non-White participants (M = 17.96, SD = 9.86).

Discussion and Implications

This is the first study of a videogame that uses perspective taking to reduce implicit bias against African Americans. We did not find that the videogame lead to decreased implicit bias compared to our control condition; however, we did find slightly reduced levels of implicit bias compared to other studies. Thus, it is possible that either playing the game or viewing the website lead to reduced implicit bias for participants in this study. Future studies should incorporate a pre-test/post-test methodology to determine whether the website or game conditions directly lead to reductions in implicit bias.

Interestingly, participants in the control condition reported more empathy for Jamal than those who played the game. One explanation for this is that *Fair Play* was designed to immerse the player as Jamal. Because empathy is the capacity to recognize the emotions in others, it would be difficult for players to experience empathy for a character designed to be an extension of them. In fact, several participants self-reported that it is difficult to have empathy for yourself, suggesting that they saw Jamal as an extension of themselves. This suggests that empathy may not be a compelling measure to study players using games that foster projected identity, unless the players' empathy for other non-player characters is of key interest. Future studies should explore additional factors that lead readers of the website to report more empathy for Jamal.

Female participants reported more perspective taking and empathy for Jamal and White participants reported more empathy for Jamal. Future studies should examine the specific factors that lead to this difference. Future studies should also include more racial/ethnic minority participants so that differences among minority groups can be unraveled.

References

Batson, C. D., Early, S., & Salvarani, G. (1997). Perspective-taking: Imagining how another feels versus imaging how you would feel. *Personality and Social Psychology Bulletin*, *23*(7), 751-758.

Batson, C. D., Polycarpou, M. P., Harmon-Jones, E., Imhoff, H. J., Mitchener, E. C., & Bednar, L. L. (1997). Empathy & attitudes: can feeling for a member of a stigmatized group improve feelings toward the group? *Journal of Personality and Social Psychology*, *72*(1), 105-118.

Boyson, G.A., & Vogel, D.L. (2008). The relationship between level of training, implicit bias, and multicultural competency among counselor trainees. T*raining and Education in Professional Psychology, 2*(2), 103-110.

Clore, G. & Jeffery, K. (1972). Emotional role playing, attitude change, and attraction toward a disabled person. *Journal of Personality and Social Psychology, 23*(1), 105.

Cvencek, D., Meltzoff, A. N., & Greenwald, A. G. (2011). Math–gender stereotypes in elementary school children. *Child Development, 82(3),* 766-779.

Devine, P. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*(1), 5-18.

Gee, J. P. (2003). *What video games have to teach us about learning and literacy*. New York, NY: Palgrave Macmillan.

Ginther, D. K., Schaffer, W. T., Schnell, J., Masimore, B., Liu, F., Haak, L. L., & Kington, R. (2011). Race, ethnicity, and NIH research awards. *Science, 333*(6045), 1015-1019. doi: 10.1126/science.1196783

Green, A.R., Carney, D.R., Pallin, D.J., Ngo, L.H., Raymond, K.L., Lezzoni, L.I., & Banaji, M.R. (2007). *Implicit Bias among physicians and its prediction of thrombolysis decisions for black and white patients. Journal of General Internal Medicine, 22*(9), 1231-1238.

Greenwald, A., McGhee, D., & Schwartz, J. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology*, *74*, 1464-1480.

Krebs, D. (1975). Empathy and altruism. *Journal of Personality and Social Psychology, 32*(6), 1134-1146.

National Science Foundation. (2008). National Science Foundation/National Center for Science and Engineering Statistics, Survey of Doctorate Recipients. Retrieved from National Science Foundation website: http://www.nsf.gov/statistics/srvydoctoratework/

Nosek, B. A., Banaji, M. R., & Greenwald, A. G. (2002). Harvesting implicit attitudes and beliefs from a demonstration website. *Group Dynamics: Theory, Research, and Practice*, *6*(1), 101–115.

Nosek, B. A., Smyth, F. L., Hansen, J.J., Devos, T., Lindner, N.M., Ranganath, K, A., Smith, C.T., Olsond, K.R., Chugh, D., Greenwald, A., & Banaji, M.R. (2007). Pervasiveness and correlates of implicit attitudes and stereotypes. *European Review of Social Psychology, 18*(1).

Nosek, B. A., Smyth, F. L., Sriram, N., Lindner, N. M., Devos, T., Ayala, A., et al. (2009). National differences in gender-science stereotypes predict national sex differences in science and math achievement. *Proceedings of the National Academies of Science 106*(26)*,* 10593-10597.

Palepu, A., Carr, P., Friedman, R., & Ash, A. (2000). Specialty choices, compensation, and career satisfaction of

underrepresented minority faculty in academic medicine. *Academic Medicine, 75*(2), 157.

Peterson, N. B., Friedman, R.H., Ash, A. S., Franco, S., & Carr, P. L. (2004). Faculty self-reported experience with racial and ethnic discrimination in academic medicine. *Journal of General Internal Medicine*, *19*, 259-65.

Pololi, L., Cooper, L.A., & Carr, P. (2010). Race, disadvantage and faculty experiences in academic medicine. *Journal of General Internal Medicine, 25*(12), 1363-1369.

Quality Education for Minorities Network. (2010). Final report of the spring 2010 workshop on the recruitment and retention of African American male students in science, technology, engineering and mathematics (STEM). Retrieved from: http://www.qem.org/Minority%20Male%20Reports%202012/ African%20 American%20Males%20Report%5B5%5D.pdf

Reid, L. D. (2010). The role of perceived race and gender in the evaluation of college teaching on RateMyProfessors. Com. *Journal of Diversity in Higher Education, 3*(3), 137-152. doi: 10.1037/a0019865

Schell, J. (2008). *The art of game design: A book of lenses*. Boston, MA: Morgan Kaufmann.

Singh, K., Robinson, A., & Williams-Green, J. (1995). Differences in perceptions of African American women and men faculty and administrators. *Journal of Negro Education, 64,* 401-408..

Solorzano, D, Ceja, M., & Yosso, T (2000). Critical race theory, microaggressions, and campus racial climate: The experiences of African American college students. *The Journal of Negro Education, 69*(1/2), 60-73.

Squire, K. (2011). *Video games & learning: Teaching and participatory culture in the digital age*. New York, NY: Teachers College Press.

Todd, A. R., Bodenhausen, G. V., Richeson, J. A., & Galinsky, A. D. (2011). Perspective-taking combats automatic expressions of racial bias. *Journal of Personality and Social Psychology*, *100*(6), 1027-1042.

Toi, M. & Batson, C. (1982). More evidence that empathy is a source of altruistic motivation. *Journal of Personality and Social Psychology*, *43*(2), 281-292.

Turner, R. N. & Crisp, R. J. (2010) Imagining intergroup contact reduces implicit prejudice. *British Journal of Social Psychology*, *49*, 129-142.

Yee, N. & Bailenson, J. (2006). Walk a mile: The impact of direct perspective-taking on the reduction of negative stereotyping in immersive virtual environments. *Proceedings of PRESENCE 2006: The 9th Annual International Workshop on Presence*. Cleveland, OH.

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