Resource Allocation in a Social Decision-Making Task

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Introduction

People categorize others based on factors such as, sex, race, and political affiliation. "Ingroups" are those similar to us, while "outgroups" are those we consider to be different (Tajfel, 1982). Bias against a certain group can lead to discrimination and prejudice (Hewstone et al., 2002), and can depend on location and physical appearance: the two dimensions central to our study. There is also in-group favoritism (Peterson et al., 2004; Tajfel and Turner, 1986), "the tendency to respond more positively to people from our ingroups than we do to people from outgroups" (Jhangiani et al., 2014).

Tajfel et al. showed that groups based on arbitrary preferences gave more points to themselves than to those with different preferences (Tajfel et al., 1971). Greenwald et al. (2014) showed that in-group favoritism can lead to discrimination by measuring emotional responses to White and Black faces. Mutz et al. looked at in-group favoritism in trade, demonstrating that Americans valued the well-being of other Americans more than those in other countries (Mutz et al., 2017).

We used a test of sports fandom (Capella, 2002; Phua, 2010), prejudice against immigrants and ethnic minorities (Akrami et al., 2000; ISSP Research Group, 2015), and nationalism (ISSP Research Group, 2015): assessments depending on physical appearance and geographic distance. We then determined how people allocated resources to others based on appearance and location and related choices to personality.

Methods
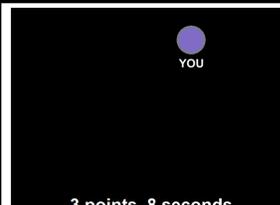
Twenty-nine participants (mean age = 18.2 years; 22 female, 7 male) played the task. In part one, 36 rounds were played in which colored circles labeled as "YOU" were presented in a random location. Participants were told to allocate 1, 3, or 5 points to other participants (a "selection number") and were given 1, 2, or 3 seconds per allocation. Four randomly ordered rounds were played for each combination.

After a delay, new circles appeared representing other players, and clicking on a circle would give them a "point." These circles had random colors/locations, but there was one circle the same color as, and one maximally different from, the "YOU" circle. Color differences between the "YOU" circle and the other circles were uncorrelated with differences in location. This tested participants' preference for giving resources to individuals similar in appearance and location. We also measured their tendency to minimize effort by clicking circles close to the cursor's previous location. To ensure they were paying attention, participants were sometimes asked for the "YOU" circle's prior location/color.

Methods continued
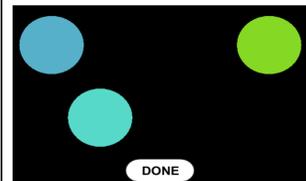
To assess subjective similarity between the "YOU" circle and selected circles, in part two participants moved a colored circle to the "balance point" between the two colored circles above it. In part three, participants completed a survey that displayed a sequence of statements (randomly ordered) and used a 5-point Likert scale.

To incentivize performance, participants were told that a "bonus" system was implemented so that the winner of a $25 SHU bookstore gift card would be randomly selected based upon the points each participant earned.

Results

We asked how biased were participants regarding appearance, location, and minimization of effort. Also of interest were whether biases were related to one another, and whether biases were related to participants' personality. Circles were put in "selected" and "unselected" groups and compared. The distance from circles to the "YOU" circle (in geographic or color space) was summarized as a "bias metric" that subtracted the values for the selected circles from the unselected ones. For example, a large, positive value "appearance bias" meant the participant consistently chose circles with colors similar to the "YOU" circle. If a participant chose randomly, selected and unselected groups would not differ, resulting in a value of 0.
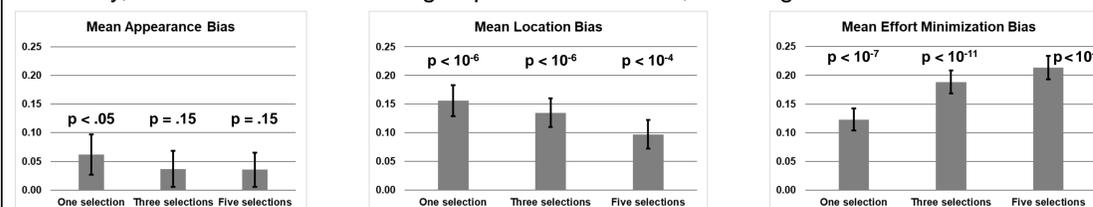
Participants picked 1, 3, or 5 circles in each round; one-sample t-tests determined if the bias metrics across participants were different from zero in each condition. As the bar graphs show, the participants exhibited appearance bias when picking one circle ($M = .062$; $SD = .155$; $t(28) = 2.17$, $p < .05$) but not three ($M = .038$; $SD = .137$; $t(28) = 1.47$, $p = .15$) or five ($M = .036$; $SD = .130$; $t(28) = 1.47$, $p = .15$). They exhibited location bias across selections of one ($M = .156$; $SD = .119$; $t(28) = 7.08$, $p < 10^{-6}$), three ($M = .134$; $SD = .109$; $t(28) = 6.63$, $p < 10^{-6}$), and five circles ($M = .096$; $SD = .110$; $t(28) = 4.69$, $p < 10^{-4}$). They were also biased toward effort minimization across one ($M = .124$; $SD = .085$; $t(28) = 7.91$, $p < 10^{-7}$), three ($M = .188$; $SD = .088$; $t(28) = 11.46$, $p < 10^{-11}$), and five circles ($M = .214$; $SD = .089$; $t(28) = 12.97$, $p < 10^{-13}$).
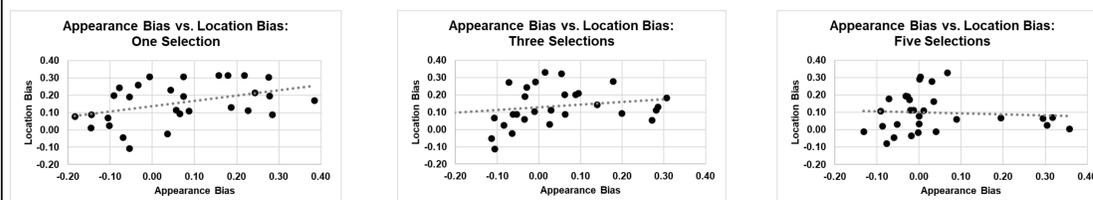
The relationship between appearance and location bias changed with selection number. When choosing one circle, these biases had a modest positive correlation $r(27) = .40$, $p = .03$. When selecting three, the correlation was positive but non-significant, $r(27) = .18$, $p = .35$. When selecting five, the correlation was non-significant and negative, $r(27) = -.07$, $p = .73$. Finally, there was a marginal negative correlation between appearance bias and sports fandom, $r(27) = -.33$, $p = .08$ – this trend was not attributable to any one selection number.
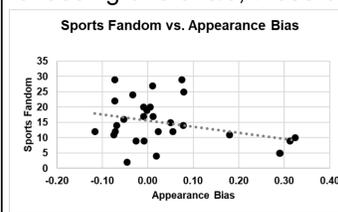
Discussion

We studied participants' bias in allocating points to others that differed in appearance and location. "Bias metrics" compared selected circles to unselected ones, and were categorized based on how many circles were chosen, thus determining the impact of resource scarcity.

When selecting one circle, participants gave points to others that were similar to themselves in appearance but this bias was not present when giving out additional resources. In contrast, participants were heavily biased toward circles that were closest to the "YOU" circle and circles closest to the previous location of the cursor, regardless of selection number. Bias metrics also had a correlational structure: a positive correlation between appearance and location biases when one circle was selected, but no relationship as the selection number increased. That is, individuals biased toward others based on appearance were *also* biased toward others that were nearby, but only when resources were scarce. A marginally significant negative correlation between sports fandom and appearance bias suggests that bigger sports fans exhibited less favoritism toward those similar in appearance.

Limitations include the small sample size – data collection is still underway. As the pool consisted of introductory psychology students, it was also narrow in scope. In addition, participants may have exchanged information about the project, though they were instructed not to. Finally, a 25$ bookstore gift card may have been too little incentive to act as a valuable resource.

We conclude that, even in an abstract setting, humans tend to treat ingroup members better than those in an outgroup, especially when resources are scarce. In addition, it seems that these biases are correlated when resources are scarce but are expressed independently when they are plentiful.

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