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Development of Racial Essentialism in Early Childhood

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Abstract

To analyze the development and nature of essentialist beliefs about race in early childhood, we replicated Mandalaywala and colleagues' original study on the topic, in which a "switched-at-birth" task was used to test participants' beliefs about the heritability of skin color and behavioral/psychological traits. We accessed their data through OSF and implemented quasibinomial and linear regression models using RStudio. As an extension to the original study, models were modified to incorporate participant sex as a variable. Overall, children judged skin color to be more heritable when the race of the birth mother was white but neither participant race nor sex was a strong predictor of general beliefs about the heritability of skin color. As expected, greater outgroup exposure was associated with a decrease in racial essentialism. Additionally, we found that Black participants exhibited higher levels of racial essentialism, and both Black participants and female participants displayed greater warmth toward Blacks. Despite children viewing skin color as a highly heritable factor, they do not hold strong causal essentialist beliefs of race, and these beliefs are further affected by the level of outgroup exposure that participants experience. Upon extending this model to compare across participant sexes, the results suggest that emotion-based judgments such as warmth toward Blacks differ more greatly between sexes, while general essentialist beliefs were not as differentiable. Essentialist beliefs may form more on the basis of intellectual development, in which there is a minimal distinction between males and females, rather than emotional experiences. The reason for certain variations across participant sex is hard to pinpoint but all in all, sex was not a significant determining factor in developing essentialist beliefs about race in children.

Keywords: Race, sex, racial essentialism, heritability, skin color, behavior

1. Introduction

Numerous scientific disciplines have demonstrated that race is a socially rooted category rather than something based on biology.² This concept of race has divided people worldwide into "biologically distinct" categories, but there are no proven genetic or biological traits that classify people based on the color of their skin. Instead, humans constructed the concept of race and have since exploited it to establish a hierarchy of oppression and violence. In the 21st century, race is one of the most pertinent topics in the United States, but what exactly does it mean, and what consequences does it hold? This study explores the development of racial essentialism--the idea that a category (in this case race) has a particular underlying nature that is common across members of the category¹--among children. How early are attitudes around racial essentialism formed, and how do these initial subconscious biases translate to actions later in life? The topic holds great significance in the broader field of cognitive science and neuropsychology. It can potentially reshape our understanding of how racial attitudes and social categorizations like race may form and how we may begin correcting certain negative racial attitudes, which has critical social implications.

Due to centuries of misinformation, people continue to hold inconsistent and inaccurate beliefs about the inherent nature of race despite the overwhelming scientific evidence. Psychological essentialism, "a set of cognitive biases that lead people to view members of a category as sharing a deep, underlying essence that causes them to be fundamentally similar in obvious and non-obvious ways," is a major driving force behind these beliefs.^{3,4} Ultimately, these beliefs shape people's views toward members of different categories; associated negative social consequences include racial stereotyping, prejudice, and negative feelings towards cross-race interactions.⁵ Continued research into

the developmental origins of racial essentialism seeks to address and reduce these predominant behaviors.

Countless studies have found that biases are present from a young age.⁶ However, views on race and racial essentialism are not uniform across cultures, as exposure to ethnic diversity can significantly impact developing essentialist attitudes.⁷ Moreover, younger children are less likely than older children to ascribe certain traits to certain races, indicating that age plays a formative role.⁸ All these factors indicate the importance of experience and environment, including parental beliefs and societal exposure, in developing essentialist beliefs

A study conducted by Mandalaywala and colleagues⁹ closely scrutinized the development of essentialist beliefs about race starting from a young age to further understand how children view race in essentialist ways, how their experiences influence that view, and the possible implications for their long-term essentialist beliefs on racial attitudes. They collected data amongst 203 children, with an average age of 5.45 years, to test whether physical features indicating race were believed to be inherited and stable or emerging. Children participated in experiments such as the "switched-at-birth" task to further understand race's heritability and causal essence in their early childhood.⁹

The "switched-at-birth" task specifically examined children's beliefs about the heritability of skin color, as well as behavioral and psychological characteristics, through the following scenario: a child is born to a parent of one race but raised by an adoptive parent of either the same or different race (different race scenario). Participants' responses to questions formulated based on this scenario were analyzed to see if children would answer that the child's skin color or behavior was the same as the birth or adoptive parent.

If children answered characteristics were due to the birth parent in different race scenarios, this would indicate that responses were due to a belief that race is tied to a causally powerful essence. Contrarily, in the same race scenario, responses would simply imply general beliefs about the heritability of behavioral characteristics and skin color. They then used the analysis from this task to predict participants' overall warmth toward Black people on a like or dislike scale. As previously mentioned, experience plays a vital role in developing essentialist beliefs. So this was analyzed by including data on the child's current residential neighborhood, as well as the demographic diversity in those neighborhoods and data on the parents' essentialist beliefs. The original study rendered data to compare the responses of Black participants versus white participants.

In terms of beliefs about the heritability of skin color, the study found that children believed that the character would share the skin color of their birth mother over half of the time. However, in different race scenarios, children believed that the character shared behavioral properties with their birth mother only 31% of the time, indicating that they viewed skin color as heritable but behaviors as less heritable and possibly more shaped by the environment. Despite their view of skin color as being inherited, young children do not hold strong causal essentialist representations of race, meaning they expect what a person would be like, which was measured by responses to behavior questions in the "switched-at-birth" task, to be determined by the environment of their upbringing, not by their inherited race. The study also concluded that although most participants had low levels of essentialist beliefs, there were variations in essentialist beliefs based on the participant's group membership, social attitudes, and exposure to diversity. Overall, Black participants had higher racial essentialism and warmth toward

Blacks than their white counterparts, although there was a general increase in warmth with white participants with increased belief about the heritability of skin color.

Effectively, the study concluded that children hold only a limited belief that psychological and behavioral characteristics are associated with and constrained by an inherited 'racial essence'. Outgroup exposure affects the belief that race is tied to a causal essence, not to more general beliefs about heritability, and lastly, the upbringing and environment (i.e., their parents) of young children likely inform their attitudes and expectations.

This study aims to replicate these findings of Mandalaywala and colleagues' research, as well as further extend beyond the scope of the original study by comparing the development of racial essentialism amongst different sexes (male and female) in children rather than just comparing by race (Black or white) of the children. Note that since the terms "sex" and "gender" are both utilized throughout this paper, it is important to make clear the distinction between the two: "gender" is a social construct that is relevant in the context of the environmental and societal experiences experienced by participants; "sex" is used to refer to the biological categories of male and female. Adult participants were excluded from this study because it is difficult to measure implicit bias using these methods from the original paper, and the fact that adults are conscious of how their biases affect social standing may skew any measured explicit bias.

Replication:

2. Methods and Materials

2.1 Original Study Methods

As mentioned briefly in the introduction, 203 children participants were sampled (Black = 81, white = 122), ages 5-7 years. A “Switched-at-birth” task was used to examine children’s beliefs about the heritability of skin color as well as the heritability of behavioral/psychological characteristics. Same and different race scenarios were used, where birth and adoptive parents were either of the same race or different races. Questions about skin color and behavior were formulated based on these scenarios. For behavioral questions in the different race scenarios, responses that the child in the scenario shared characteristics of the birth parents could indicate strong beliefs about causal racial essentialism. On the other hand, the same race scenario measured more general beliefs about heritability.⁹ Skin color questions were used in Fig. 1 and 3 (Fig. 4 and 6 in the extension) and responses to behavior questions were used to generate Fig. 2 (Fig. 5 in extension).

2.2 Replication Data Analysis

Using data from the original study (collected in methods mentioned above), we generated quasibinomial and linear regression models in RStudio to visualize and replicate the findings observed in the original study. Specifically, we utilized RStudio for cleaning, plotting, analyzing, and statistical computation of the data. We accessed the data from the original study through Open Science Framework (OSF), an open-source web application center that offers researchers a place to share and collaborate on research projects. We wrote code to integrate the original data collected during the “switched-at-birth” task and data on the demographic diversity of the child’s residential neighborhoods to replicate three of the six Figures from the original study.

2.3 Predictor and Response Variables

Variables used in the model include data recorded for race of the birth mother used in the “switched-at-birth” task; beliefs about the heritability of skin color (proportion of birth mother responses for skin color questions in different race scenarios; birth mother response scored “1”, adoptive mother scored “0”); racial essentialism (proportion of birth mother responses for behavioral questions in different race scenarios; trait due to birth mother scored “1” and “0” for adoptive mother); feelings toward Blacks (scored on a scale of 1-6; 1 = really dislike, 6 = really like); and outgroup exposure (e.g. for a white child, the % of their total zip code population that identified as Black).

We plotted the proportion of birth mother responses to skin color questions in the change scenario as a function of birth mother race to generate Fig. 1, which illustrates general beliefs about the heritability of skin color; we plotted shaded bands to convey calculated 95% confidence intervals. We plotted lines of best fit in Fig. 2 using a quasibinomial generalized linear model to predict racial essentialism, which was measured as the proportion of birth mother responses to behavioral questions in the different race scenarios, from participant race and the proportion of outgroup members in the children's neighborhood. Lastly, in Fig 3, we plotted regression lines from linear models to predict warmth toward Black people based on beliefs about the heritability of skin color. Once again, we plotted shaded areas in these linear model Figures to indicate a 95% confidence band around the regression lines.

3. Results

3.1 Beliefs About the Heritability of Skin Color

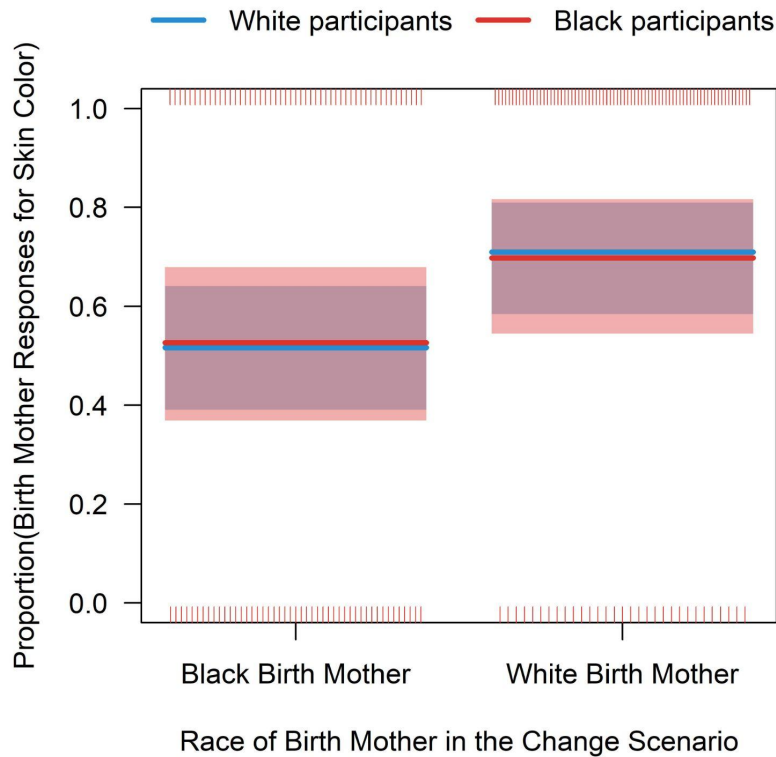


Fig. 1. Quasibinomial model measuring the proportion of birth mother responses for skin color as a function of the race of birth mother (Black or white) in the change scenario to examine a child's belief about the heritability of skin color. Responses were compared by participant race (Blue: White; Red: Black). Bands represent 95% confidence intervals. Dashes represent individual responses.

Using data from the “switched-at-birth” task conducted in the original study, general beliefs about the heritability of skin color are compared between white and Black participants (Fig. 1). The proportion of birth mother responses for skin color is plotted against birth mother race (Black or white) in the change scenario (Fig. 1). The regression model identified birth mother race as a significant predictor for a child's belief about heritability of skin color, $\beta = 0.83$, $SE = 0.38$, $t = 2.15$, $p = 0.033$. In other words, children were more likely to believe skin color to be heritable if the birth mother was white. As in the original study, children judged skin color to be 2.29 (CI = 1.08, 4.93) times more heritable for white versus Black birth mothers. This interaction did not differ across

participant race, $p = 0.93$, so both Black and white children responded in a similar pattern.

3.2 Role of Experience on the Development of Beliefs

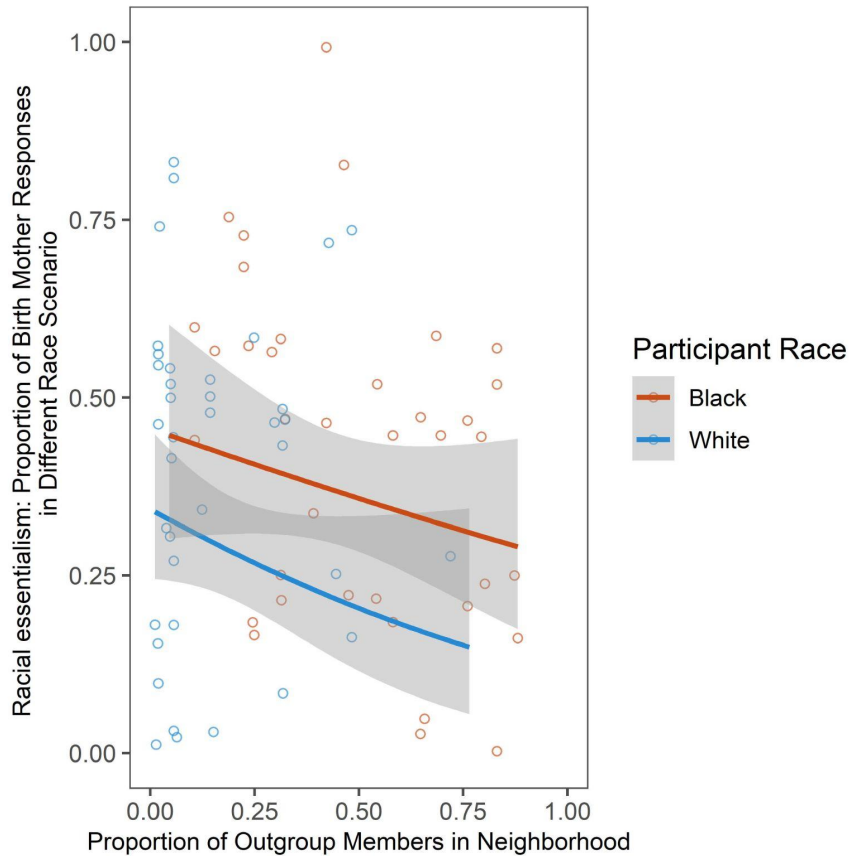


Fig. 2. Regression lines from linear models depict racial essentialism (y-axis) as a function of the proportion of outgroup members in the neighborhood (x-axis), segmented by participant race. The red and blue lines indicate the line of best fit for Blacks and whites, respectively. Dots denote individual responses and shaded areas show 95% confidence bands around the regression line.

Fig 2. illustrates the role of experience in the development of beliefs, specifically whether the environment, in this case, outgroup exposure, determines or affects the degree of racial essentialist beliefs in children. Based on a qualitative assessment of the plot, Black participants generally lived in neighborhoods with a higher proportion of outgroup members as indicated by more red individual data points further to the right of

the graph (blue points are clustered around the lower end (0.00) of the x-axis; the majority of white participants have an outgroup score of 0.5 or lower).

For statistical analyses, we ran linear models, measuring racial essentialism as the proportion of birth mother responses to behavioral questions in the different race scenario where birth and adoptive mothers were of different races; participant race was also used in the model. Both outgroup exposure and participant race were identified as significant predictors. Greater outgroup exposure was associated with a decrease in racial essentialism, $\beta = -1.05$, $SE = 0.53$, $t = -1.97$, $p = 0.05$, and Black participants had a significantly higher proportion of birth mother responses (higher racial essentialism) than white participants, $\beta = 0.65$, $SE = 0.28$, $t = 2.29$, $p = 0.02$.

Additionally, linear models were run using the same race scenario in which birth and adoptive mothers were of the same race, as well as using skin color questions in the change scenario instead of behavioral questions. For the same race scenario, neither outgroup exposure nor participant race was found to be strong predictors for racial essentialism ($p = 0.84$ and $p = 0.85$, respectively). When responses to skin color questions were used in the model, the effect of outgroup exposure also became less significant ($p = 0.09$). Furthermore, we again observed that when the birth mother was white, there was an associated increase in birth mother responses from the participants, $\beta = 1.03$, $SE = 0.47$, $t = 2.2$, $p = 0.03$, which parallels our observations in Fig. 1, where children were more likely to believe skin color to be heritable if the birth mother was white.

These results align with the findings in the original study where there were also no interactive effects between outgroup exposure and participants' responses to

behavioral questions in same race scenarios, or with beliefs about the heritability of skin color, “suggesting that outgroup exposure only affected the belief that race is tied to a causally powerful essence (as detected by the different race scenario-type questions), not to more general beliefs about heritability”.⁹ It can be concluded that Black participants have more outgroup exposure than white participants but hold more overall racial essentialism. However, ultimately, more outgroup exposure leads to a decline in racial essentialism for both races.

3.3 Warmth Toward Blacks

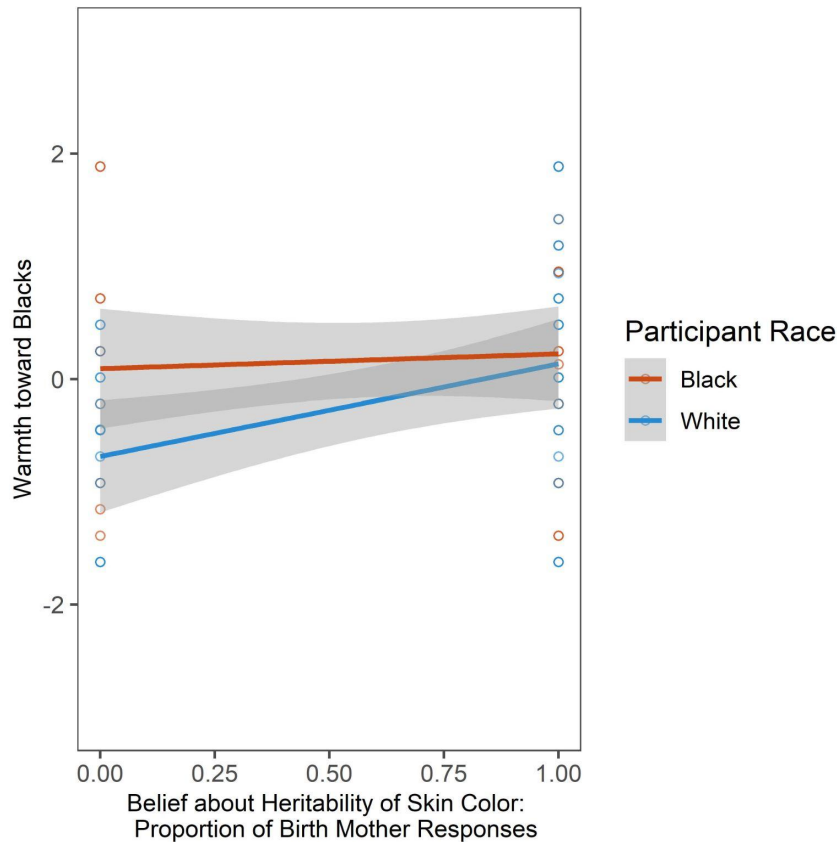


Fig. 3. Regression lines from linear models predicting warmth toward Blacks as a function of belief about the heritability of skin color, which was measured as the proportion of birth mother responses for the skin color question asked during the “switched-at-birth” task. Results are segmented by participant race (Red: Black; Blue: White). Dots denote individual participants and shaded areas represent 95% confidence bands around the regression line.

For Fig. 3, a linear model was applied in an attempt to predict children's feelings of warmth toward whites and Blacks using both their beliefs about the heritability of skin color and their race. The model identified participant race as a strong predictor for overall feelings towards Blacks, with Black participants showing greater warmth toward Blacks compared to white participants, $\beta = 1.06$, $SE = 0.38$, $t = 2.81$, $p = 0.006$. Although birth mother responses did not have a strong correlation with warmth toward Blacks, $p = 0.16$, we did observe strong interactive effects between participant race and proportion of birth mother responses, $p = 0.02$. In white participants, there was an evident positive trend between beliefs about the heritability of skin color and overall warmth, meaning that white children who had higher beliefs about the heritability of skin displayed more warmth toward Blacks. This interaction was not found in Black participants.

4. Discussion of Replication

4.1 Evaluation of Replication

Overall, our data support the same overall conclusions as the original paper: children do not hold strongly causal essentialist representations of race. Though Fig. 1 shows that young children do tend to view skin color as inherited- more so when the birth mother is white, Fig. 3 shows that this belief does not necessarily affect racial attitudes. White participants' responses had a positive correlation between warmth towards Black people and skin heritability, but there was no correlation between those values for Black participants (Fig. 3). So, even though children may believe in skin color heritability, they have not tied that belief to an essentialist representation of race. If they had, there would have been a negative correlation between skin heritability belief and warmth towards Blacks. It is worth noting that the lack of correlation between those two variables for

Black participants may be due to racial boundaries being more salient to them as minorities, so they end up reinforcing essentialist views of social structure more so than their white counterparts.

Fig. 2 shows that the race of the participants affects one's race essentialism less than outgroup exposure does- though Black participants have more outgroup exposure than white ones. Like in the original paper, the outgroup exposure analysis shows that there is a negative relationship between outgroup exposure and the belief that race is tied to a causally powerful essence (heritage or genetics, for example), but no relationship between participant race and this belief. This relationship does not extend to wider heritability beliefs.

Considering that in all of our other figures, participant race did not have a significant impact on race essentialist beliefs, we can conclude that though essentialism can shape racial attitudes (Fig. 3), it is more likely to do so if it is in combination with external experiences and knowledge (Fig. 2). Having more exposure to diverse groups of people may make the assignment of stereotypical behavior, and consequently, the belief of its heritability, less likely. So, more outgroup exposure and diverse experiences can potentially combat racial essentialism. Additionally, the belief that race is tied to causally powerful essence varies in relation to the child's environmental experiences and is endorsed at low levels in childhood. Lots of time and cultural input are necessary to develop these essentialist beliefs. So, since cultural experiences are widely variable, both the development and consequences of racial essentialism are variable as well.

Ours and the original author's findings are supported in the wider literature. Other studies on race concur on the significance of cultural influence on social attitudes. A

study on frankness¹⁵ during discussions of race found that younger children performed better, by acknowledging race more frankly, than older children in this task. Older children, who exhibited greater awareness of racial stereotypes, tended to avoid mentioning race. This could also be due to greater social awareness, as mentioning race is often considered inappropriate. So, younger children who have not internalized social conventions are able to outperform older children when acknowledging race is important. These findings are significant to our study, as it highlights how internalizing social conventions can shape racial attitudes. Though this study does not emphasize essentialism, the results support the idea that racial attitudes are not necessarily passed down through parents, but rather, are shaped by experience and environment¹⁰.

Many studies^{11,12} also conclude that essentialist beliefs about race develop and vary in relation to the child's environmental experience. Children require certain language and social cues to be able to have specific essentialist beliefs¹², which can vary across cultures, so it follows that essentialist beliefs can also vary within an age group across different geographical locations.¹¹ Both of these studies corroborate our conclusion that cultural input is needed to develop essentialist views of race.

Additionally, our conclusions are supported in the wider cultural context. In a study on gender essentialism¹³, it was found that children's gender essentialism was unrelated to either gender stereotyping or implicit gender-relevant associations, but it predicted the strength of their gender-typed preferences. Similarities between this study and the study on racial essentialism include the lack of association between parents' social essentialism and children's, parents' essentialism correlating to stereotyping, while children's did not, and that essentialism is more likely to shape social attitudes in

combination with other experiential factors. Though, it is notable that gender essentialism does not take as much time to develop as race essentialism.

Studies on moral essentialism also support our conclusions. For both parents and children in a study by Larisa Heiphetz¹⁴, more participants tended to view goodness, not badness, in essentialist ways. This supports the observations of our study, wherein people are more likely to associate good traits as inborn with whiteness. Since both children and adults viewed goodness more than badness in essentialist terms, these results suggest that this pattern is not dependent on experience or cognitive maturity.

To evaluate the extent to which culture influences the development of essentialist beliefs, it is necessary to repeat this study across different cultures. Adjustments may have to be made to include different ideas and hierarchies about race that are specific or isolated to particular cultures. Additionally, a longitudinal study with the same participants as this, or the original study, could reveal if cohort effects influenced any of the data. Future studies could also investigate essentialist ideas involving gender or morality, in addition to essentialist beliefs about race, to more thoroughly show the extent to which children internalize cultural ideas.

4.2 Future Directions

Further repetitions of this study should increase the sample size for parents, and expand upon the limited measures for the parents, taking care to measure only implicit bias. Explicit bias may have been indirectly revealed in this study, as adults can see through the intent of tasks more easily than children. Expansions of this study's scope could also explore the effects of a participant's own gender on their essentialist beliefs.

Examining gender as an independent variable here would serve to more thoroughly investigate the extent to which children internalize cultural ideas and when.

For these reasons, our extension to the original study will investigate the effect of participant sex on essentialism to provide further insight into how children form essentialist beliefs overall. This could demonstrate how the social constructs of gender and race interact and manifest cognitively.

5. Extension

In this extension, we focus on how the development of essentialist racial beliefs appears to differ between the two sexes of children sampled and whether or not there is an isolated effect of participant sex on essentialism, as well as general racial attitudes.

Males and females tend to differ in emotional experiences. Females have higher levels of reported empathy and overall warmth¹⁶. Psychological and behavioral studies have also indicated that females likely have more highly developed networks involved in affective empathy¹⁷. One study, in particular, looked at how factors such as gender, race, age, college student status, and immigration status can influence different views of race¹⁸

The study evaluates levels of speciation and behavioral essentialism. It defined *speciation* as the belief that races are distinct "natural" kinds representing subspecies or even the various stages of evolution. For instance, some people believe that Black people represent more early stages of evolution¹⁸. *Behavioral essentialism* refers to the belief that "race (represents) cultural or behavioral tendencies" with "minimal appreciation of variability in the cultural and ethnic and personal tendencies within the racial group"¹⁸. The data suggested that males had significantly higher levels of speciation and behavioral essentialism than females¹⁸.

Fig. 1 in the replication did not account for emotional biases or causal essentialist views, so there is no evidence suggesting that separating by sex will alter the main effect of birth mother race on beliefs about skin color heritability. For Fig. 2, the initial graph had several outliers outside the shaded ban, indicating that the potential association was not strong and we might see the same general negative trend between outgroup exposure and racial essentialism. However, if males do in fact hold significantly higher levels of racial essentialism than females as cited in previous literature, we may find a significant difference across participant sex.

We further predict a variation between participant sexes in Figures affected by emotional outcomes, such as "Warmth toward Black Individuals" (Fig. 3). Male children might hold more essentialist beliefs about race than females and might subsequently maintain more negative racial attitudes, potentially leading to a decrease in warmth towards Blacks. Additionally, as mentioned earlier, females have higher levels of empathy and warmth in general, which could factor into their overall warmth toward Black individuals.

6. Methods and Materials

Before running code for our extension, we counted and calculated the ratio between Black and white participants for the original dataset, including both sexes, and then for the male and female-only datasets to ensure the ratios did not vary significantly to skew the data we observed. For our actual extension, we created a new Rmd file in RStudio that altered all lines of code referencing participant race as a function variable to participant sex instead and added participant sex as a variable in the linear models (Figs.

4, 5, and 6). All other components of the original plots used in the replication remained unchanged.

7. Results

Race ratios remained relatively constant across the three datasets involving participant race. The original ratio (all sexes included) was 1090:2075 (Black: white) or 52.53%; the females-only ratio was 615:1230 or 50%; and lastly, the males-only ratio was 470:840 or 55.95%. Thus, we could eliminate concerns about our data being skewed when separating the data by sex.

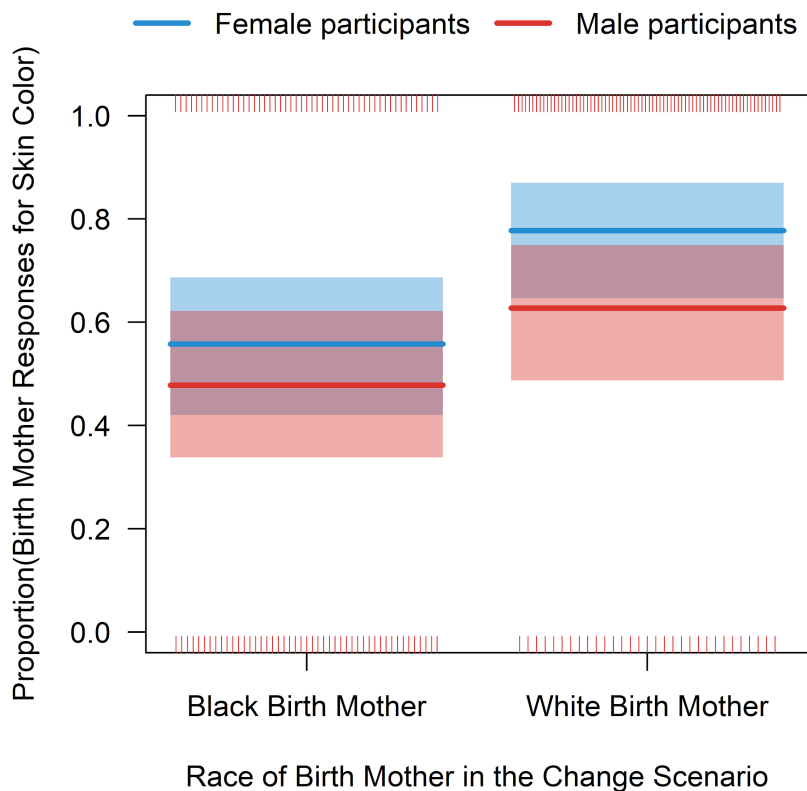


Fig. 4. Quasibinomial model measuring the proportion of birth mother responses for skin color as a function of the race of birth mother (Black or white) in the change scenario to examine a child's belief about the heritability of skin color. Responses were compared by participant sex (Blue: Female; Red: Male). Bands represent 95% confidence intervals. Dashes represent individual responses.

Fig. 4 examines the interaction between participant sex (instead of participant race) and birth mother race as potential predictors of children's beliefs about the heritability of skin color. Birth mother race was a significant predictor, with scenarios using a white birth mother receiving a significantly higher amount of birth mother responses for skin color, $\beta = 1.02$, $SE = 0.43$, $t = 2.35$, $p = .02$. On the other hand, participant sex was not found to be a significant predictor, $p = 0.44$. We also observed no interactive effects between participant sex and birth mother race, $p = 0.5$.

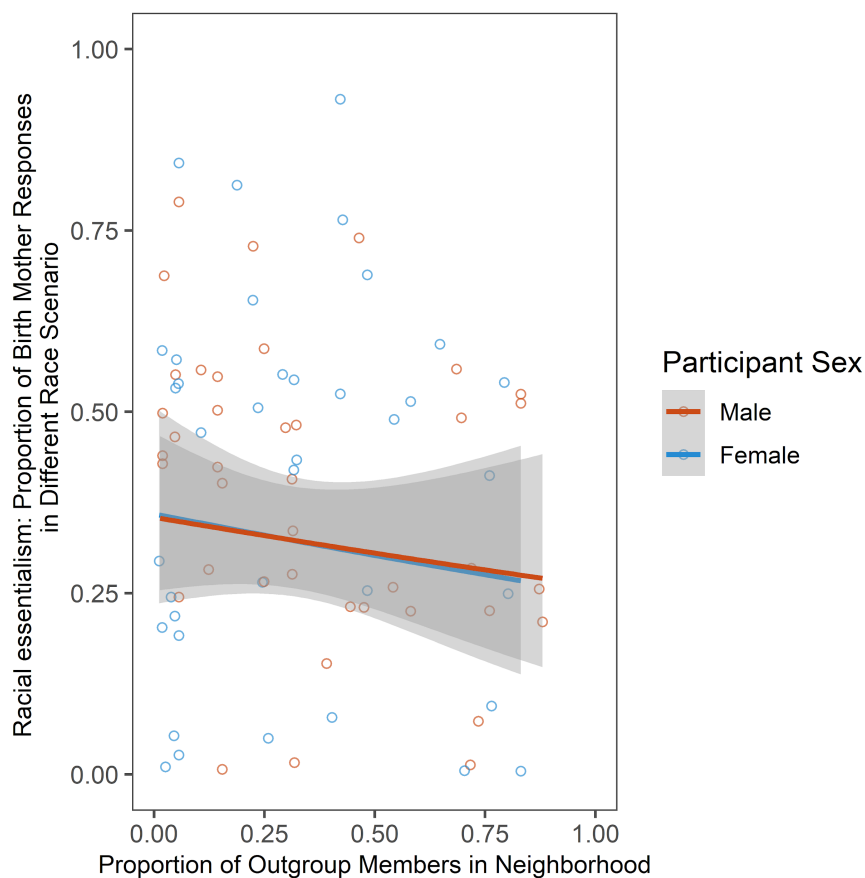


Fig. 5. Regression lines from linear models depict racial essentialism (y-axis) as a function of the proportion of outgroup members in the neighborhood (x-axis), segmented by participant sex. The red and blue lines indicate the line of best fit for males and females, respectively. Dots denote individual responses and shaded areas show 95% confidence bands around the regression line.

As in the replication (Fig. 2), Fig. 5 illustrates the impact of outgroup exposure on the development of racial essentialism. We ran linear models to analyze the effects of

outgroup exposure on children's degree of racial essentialism, which was measured as the proportion of birth mother responses to behavioral questions in the different race scenario (birth and adoptive mothers were of different races). For the extension, we included participant sex in the model in addition to participant race. Males and females both exhibited a decrease in racial essentialism with an increase in outgroup exposure, $\beta = -1.05$, $SE = 0.54$, $t = -1.97$, $p = 0.05$. However, the relationship did not differ significantly across participant sex, $p = 0.95$.

We also ran a second linear model (not illustrated) analyzing the relationship between outgroup exposure and the proportion of birth mother responses to skin color questions in the different race scenario in lieu of behavioral questions. In this model, outgroup exposure had less of an effect on birth mother responses, $p = 0.096$, however, the relationship did differ across participant sex with males exhibiting fewer birth mother responses than females, $\beta = -1.03$, $SE = 0.49$, $t = -2.1$, $p = 0.04$, suggesting that males have lower beliefs about the heritability of skin color. As mentioned in the replication, the different race scenario in the "switched-at-birth" task is the best measure for causal racial essentialism⁹ so although males have lower beliefs about the heritability of skin color, this simply reflects more general beliefs about heritability and not racial essentialism. Racial essentialism did not differ significantly across participant sex (Fig. 5). Furthermore, in scenarios where the birth mother was white, there was a significantly higher proportion of birth mother responses than when the birth mother was Black, $p = 0.02$, suggesting that participants believe white skin to be more heritable.

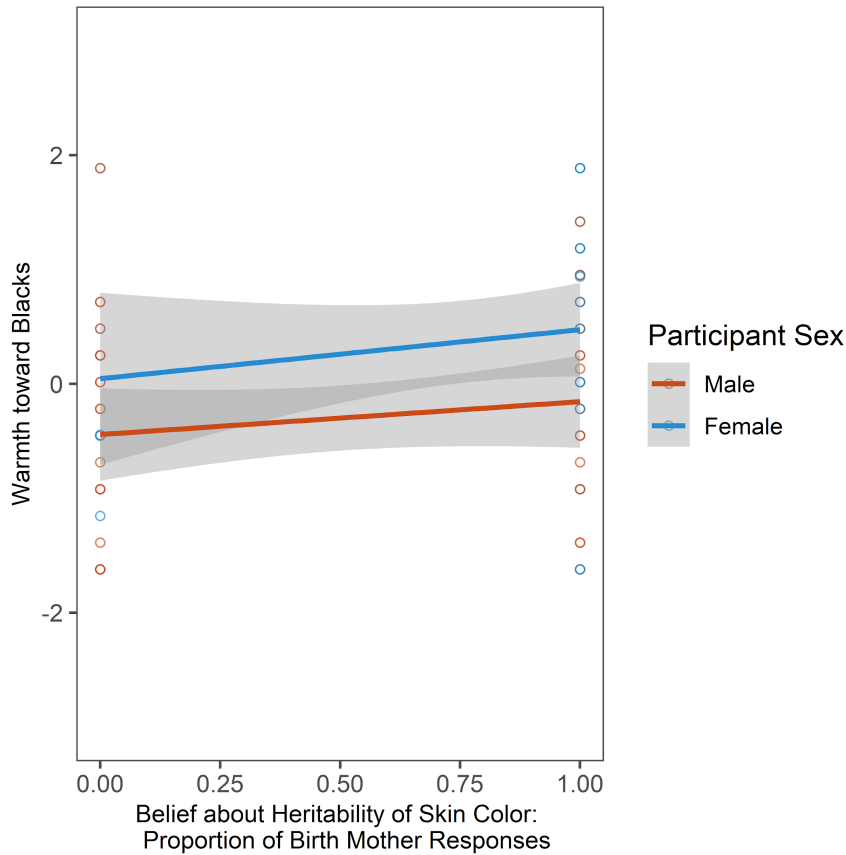


Fig. 6. Regression lines from linear models predicting warmth toward Blacks as a function of belief about the heritability of skin color, which was measured as the proportion of birth mother responses for the skin color question asked during the “switched-at-birth” task. Results are segmented by participant sex (Red: Male; Blue: Female). Dots denote individual participants and shaded areas represent 95% confidence bands around the regression line.

Finally, in Fig. 6, linear models were used to predict warmth toward Blacks using beliefs about the heritability of skin. This model identified participant sex as a significant predictor for feelings toward Blacks, $p = 0.004$, with females exhibiting higher overall warmth toward Blacks. Although both sexes displayed a positive correlation between the proportion of birth mother responses and warmth toward Blacks, this correlation was not significant, $\beta = 0.12$, $SE = 0.16$, $t = 0.72$, $p = 0.47$. There was also no interaction between birth mother responses and participant sex, $p = 0.38$.

8. Discussion of Extension

8.1 Previous Literature

The only variable that differed drastically across participant sex was warmth toward Blacks. Females exhibited significantly more warmth towards Blacks in comparison to males, which is what we hypothesized. Other findings in previous literature are consistent with these results; they also describe women as being generally warmer than men. In one study that observed gender differences in personality and social behavior, they collected data using the interpersonal circumplex model (also known as IPC)¹⁹. This model measured the levels of dominance and nurturance between the two genders, and it was found that males score higher in dominance and lower in nurturance¹⁹. Along with analyzing scores on similar tests measuring other personality traits, the study summarized that males are more assertive, tough-minded, and cold-hearted. In contrast, females were found to be more nurturing, warm, and altruistic¹⁹. In another piece of literature, they also looked at gender differences, particularly in people diagnosed with personality disorders. An antisocial personality disorder is characterized by a person showing no regard for the feelings of others, so their overall lack of empathy results in their tendency to treat others harshly and disrespectfully. A large-scale epidemiological survey revealed that at least 80% of those meeting the criteria for the diagnosis of antisocial personality disorder were men, and this is due to the underlying trait of impulsive aggression more common in males²⁰. Like the first study, the findings were consistent to support that men demonstrate more assertiveness and dominance, whereas females exhibit more nurturance²⁰. The source of these gender differences could be attributed to heritable genetics underlying personality traits as well

as the different societal experiences that males and females undergo²⁰. Ultimately, females might exhibit more warmth towards Blacks as a more natural instinct of their personality and social behavior.

As in the replication, children's development of essentialist beliefs about race were greatly influenced by their environment, specifically outgroup exposure. However, the influence of outgroup exposure did not differ across participant sex so both males and females exhibited similar levels of racial essentialism. While traits such as empathy and nurturance may differ greatly between males and females, overall cognitive and intellectual development differs minimally across sexes, with small variations potentially being due to cultural factors.²¹ Although, males may be more variable than females in certain aspects of learning such as general knowledge and quantitative ability.²³ The development of the belief that there is a causal essence determining a person's behavior is more of a learned form of thinking rather than thoughts formed on the basis of feeling, as in the case of ranking feelings toward Blacks. Males did have a lower belief about the heritability of skin color, indicating that there may be some variation in the way males and females perceive and learn about their environment. For example, one study found that women relied more heavily on authority when learning and were "more prone to collect others' ideas rather than debate opinions".²² Thus, females may pick up on information from their environment and form opinions based on them more often than males, which may contribute to certain variations in intellectual beliefs we observed between males and females.

8.2 Future Directions

Lastly, the population sampled in the original study had uneven numbers of males and females (1,845 females vs. 1,310 males) so for future studies, we would want to recruit an equal number of male and female participants and see if we can replicate these observed differences between the two sexes.

9. Conclusion

Overall, our replication of the original study yielded the same effects, verifying the initial conclusion that essentialism is more likely to shape racial attitudes in combination with knowledge and experience. The belief that race is tied to causally powerful essence is minimal in childhood and varies in relation to a child's environmental experiences, showing that lots of time and cultural input is needed to develop essentialist beliefs. Therefore, the development and consequences of racial essentialism are variable. Our extension's purpose was to find if there were any non-external influences on race essentialism development, which is why gender effects were examined. The results show that while gender, generally, has no significant effect on one's race essentialism, those of the female sex tend to show warmer feelings towards Black people than the male sex. The cultural connections between sex and race and the binary genders may be too varied to have an explicit, specific effect on notions of race.

Given the idea that essentialism is attributed more to the culture the participant is exposed to than the race of the participant, racial diversity and acceptance of one's environment are all the more important. If essentialist beliefs about race are found in a population, then, in alignment with our data, it is likely that the culture of that population perpetuates essentialist beliefs. These findings underline the seriousness of the rising racial tensions in the world, particularly in North America, over the last few years. As the

severity of police violence against Black people and other ethnic minorities in America came to the light, the culture has been led to reevaluate our social, political, and economic institutions.

Race and racial oppression are deeply ingrained, and indeed the backbone of many of these institutions. Racist attitudes form all aspects of our daily lives, from discriminatory healthcare practices to modern property laws that have roots in slavery and indentured servitude. Therefore, children may be showing race essentialism at an early age because of the institutional forces that act upon them from even before birth. As asserted in Michael Omi and Howard Winant's *Racial Formation in the United States*¹⁰, race is not a concrete matter of biology and upbringing; it is a fluid concept. It is a hierarchy enforced by the continuity and reciprocity between the micro and macro social relations that form our social institutions. The concept of race would not exist without these institutions and vice versa. Racial essentialism developing so early in the human mind serves not only to explain why institutional ideas of racism have been sustained, despite salient racial attitudes evolving but reinforces and maintains these beliefs that uphold them. In order to dismantle these racial institutions, we need to gain further understanding of conceptions of race. With this goal in mind, future studies should focus on external environmental factors' effect on race essentialism, utilizing longitudinal and cross-cultural studies.

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