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Prejudice in the Facial Representations of Immigrants

By

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THESIS

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Abstract

The goal of the current research was to gain insight on how people visualize, or "picture in their heads", the faces of immigrants, and what role anti-immigrant biases may contribute to these facial representations. Participants (image generators) completed a reverse-correlation image-classification task in which they generated a facial image of an immigrant or a natural-born American citizen. Separate groups of participants (image raters) then evaluated these facial images on various traits (e.g., competence, trustworthiness, dominance), or classified them by perceived race/ethnicity. Results revealed that the immigrant facial representation were rated more negatively and were more likely to be classified as non-White, relative to the citizen images. These differences were more pronounced in the visualizations created by image generators who had less positive immigrant attitudes (as assessed by a Single-Category Implicit Association Test). Overall, these findings suggest that anti-immigrant biases may shape the way in which immigrants are visualized.

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Immigration in the United States

America has been called a melting pot, a nation of immigrants, and a place where others in the world can come to have their (American) dream come true. Since President Biden entered office in January 2022, there has been an unprecedented increase of the foreign-born population present in the United States (U.S.), approximately 2.9 million. In September 2022, the number of immigrants in the U.S. reached 47.9 million, the largest number ever recorded. This number is roughly 14.6 percent of the American population, or one in seven U.S. residents (Camarota & Ziegler, 2022). Based on these statistics, residents in the U.S. encounter immigrants regularly, but how might an individual view these immigrants? Are they regarded positively or negatively? What comes to mind when they are picturing these immigrants? Might their facial features resemble those associated with particular racial/ethnic groups more than others? Do they seem generally pleasant or unpleasant?

In today's political climate, immigrants and immigration policy have been at the forefront of much discourse and political divide. Immigration issues inspire many different reactions in individuals across the political spectrum. Attitudes toward immigration are apparent in various types of political propaganda and expressed politician views. Public opinions on the matter vary—from President Biden's belief that immigrants are "essential to our nation" to President Trump's belief that immigrants are not people but "animals" (Biden, 2020; Neuman, 2018). Because the social issue of immigration is so prominent, immersion in this propaganda is all but guaranteed. This may lead to the choosing of sides and the formation of biases and beliefs about immigrants and immigration policy.

A large body of political science research indicates that the media often criminalizes immigrants (Farris & Silber Mohamed, 2018; Mutz, 2018). This is typically done by portraying immigrants as undocumented, displaying images of border fences or arrests, or assuming that immigrants usually engage in some form of low-skilled employment (Farris & Silber Mohamed, 2018). Negative political propaganda focused on immigrants can evoke threats to economic resources, personal freedoms, group health, and physical safety (Brader et al., 2008; Conzo et al., 2021). Past research has found that because of these group-based threats, participants report experiencing greater anger, resentment, disgust, fear, anxiety, and pity toward typical immigrant groups than toward European Americans (Cottrell & Neuberg, 2005). Once emotions about a group are formed, they can play an integral part in the development of attitudes toward that group and its members (Dasgupta et al., 2009). These attitudes may then shape people's willingness to take political action, their support for restrictive policy measures, and their representations of what group members might look like (Brader et al., 2008; Dotsch et al., 2011).

Attitudes and Facial Representations

Attitudes can influence the way in which we "picture in our heads" the faces of individuals from different social groups (e.g., Dotsch et al., 2011; Krosch & Amodio, 2014; Lei & Bodenhausen, 2017). Measuring these facial representations can be useful in that it affords a "data-driven" method to gain insight into how a person's biases may color how they imagine the facial appearance of a particular group (Brinkman et al., 2017; Dotsch & Todorov, 2012). Past research has shown that participants generate facial representations in line with stereotypes about, attitudes toward, and emotions elicited by a group or individual (e.g., Dotsch et al., 2008; Dotsch et al., 2011; Hutchings et al., 2021; Klein et al., 2021; Lei & Bodenhausen, 2017).

For example, Dotsch et al. (2008) found that participants who harbored higher prejudice toward Moroccans produced facial representations of Moroccans that were judged by independent raters as looking more criminal and less trustworthy. In a study examining the relationship between facial representations of and attitudes toward welfare recipients, Brown-Iannuzzi et al. (2016) found that participants' visualizations were indicative of stereotypes associated with welfare recipients. Specifically, they were more likely to be classified as African American and more likely to be judged as lazy and incompetent. Facial representations of socio-economic status also reflect participant-held biases. Visualizations of lower socio-economic statuses were rated as "Blacker" than were those of middle-income or of higher-income statuses (Lei & Bodenhausen, 2017). Similar effects have been found even when examining religious biases. Facial representations of atheists were deemed as less trustworthy, less moral, and less warm than were representations of theists (Brown-Iannuzzi et al., 2017). Facial representations have also been explored in relation to political attitudes and biases. Using visualizations of former presidential candidate, Mitt Romney, Young et al. (2013) explored whether political bias toward a candidate is reflected in facial representations of that candidate. Results showed that facial representations of Romney generated by participants who supported his candidacy for president were rated as more trustworthy and more attractive than were the facial representations of Romney generated by participants who did not support his candidacy.

Facial Representations of Immigrants

Although facial representations have been examined across many different research topics, to our knowledge, no research has investigated how immigrants are visualized and whether perceivers' prejudice toward immigrants seeps into those facial representations. We aimed to address these holes in the literature by conducting experiments to investigate several

research questions: How are the faces of immigrants visualized, relative to the faces of natural-born American citizens? Specifically, are immigrant facial representations more negative than citizen facial representations? If so, is this difference magnified in the representations generated by higher-prejudice participants? Finally, what racial/ethnic groups are reflected in the images?

We examined these questions over the course of several experiments using a reverse-correlation image-classification paradigm (Mangini & Biederman, 2004). First, in an image-generation experiment, participants (image generators) created a facial representation of either an immigrant or a natural-born American citizen. Then, in an image-rating experiment, a new set of naïve participants (image raters) evaluated these facial representations on various dimensions of interest (e.g., traits, perceived race/ethnicity). Finally, in a second image-rating experiment, another new set of naïve participants rated the facial representations created by image generators who were relatively high in anti-immigrant prejudice and by image generators who were relatively low in anti-immigrant prejudice.

Image-Generation Experiment

Method

Participants (Image Generators)

For a between-subjects, two-condition design (Immigrant vs. Natural-Born American Citizen), the target sample size was set at 200 participants. This number was chosen based on a heuristic of 100 participants per condition, as uncertainties remain regarding a priori power analysis in the image-generation phase of reverse-correlation research (Brown-Iannuzzi et al., 2021). Data collection continued until this target number was surpassed, resulting in a total of 217 participants (74.1% women, 25.0% men, 0.9% nonbinary; 59.3% Asian, 18.1% Latinx, 12.0% White, 3.7% Multiracial, 2.8% Black; M_{age} = 20.2 years, SD = 2.4; some participants did

not report their gender, race/ethnicity, or age). All participants were undergraduate students who were recruited from a psychology subject pool and received course credit for their participation.

Materials

Reverse-Correlation Task. To produce the immigrant and natural-born American citizen facial representations, we used a reverse-correlation task. In the immigrant condition, noisy face images are presented simultaneously with a prompt urging participants to choose "Which face looks more like an IMMIGRANT". This was the same for the citizen condition, except the prompt urged participants to choose "Which face looks more like a NATURAL-BORN AMERICAN CITIZEN".

In both conditions, a highly averaged neutral, White, male face from the Averaged Karolinksa Directed Emotion Face Database served as the base face (Lundqvist & Litton, 1998). This face image has been used frequently in past reverse-correlation research, including studies examining facial representations of non-White racial/ethnic groups (Dotsch et al., 2008; Petsko et al., 2021). Random, unique noise patterns were then added to this base image using the *rcicr* 0.3.4.1 package (Dotsch, 2014) to create many face stimuli (see Figure 1).
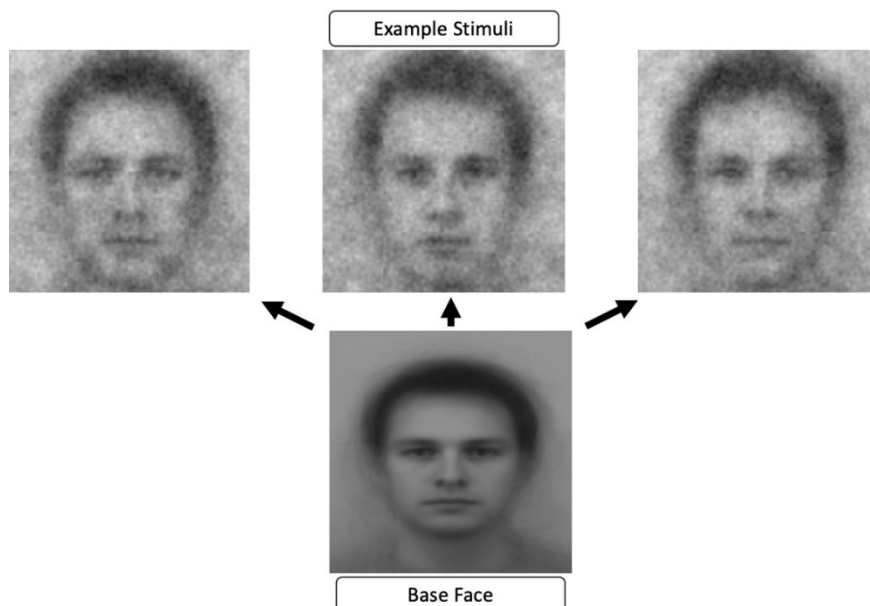
*Figure 1.* The base face used in the reverse-correlation task and a few examples of the generated stimuli.

Single-Category Implicit Association Test. To measure participants' implicit attitudes toward immigrants, we had them complete a Single-Category Implicit Association Test (SC-IAT; Karpinski & Steinman, 2006). In this task, participants complete five blocks of trials categorizing good, bad, and immigrant-related words (see Appendix A). There are two critical blocks of trials within these five blocks. In the first critical block, participants are required to categorize good words using one computer key and to categorize bad words and immigrant-related words using another key. In the second critical block, this procedure is flipped: Participants categorize good words and immigrant-related words with one computer key and bad words with another key. The logic underlying this task is that if participants are faster when pairing bad words with immigrant words than when pairing good words with immigrant words, it would reflect stronger anti-immigrant implicit attitudes (Karpinski & Steinman, 2006). Results of the SC-IAT are reported below in the second image-rating experiment.

Procedure

Participants were randomly assigned to either the immigrant or the citizen condition. Before beginning the experiment, participants learned that they would be completing several categorization tasks on a computer. They were encouraged to move through the screens as quickly as possible and to go with their "gut-feeling" when responding to the prompts. First, participants completed the reverse-correlation task to generate their facial representations. Depending on condition, they either chose which of the two images looked more like an immigrant or chose which of the two images looked more like a natural-born American citizen. In both conditions, participants completed 400 trials of the two image, forced-choice task. Next, participants completed the SC-IAT. Finally, participants reported demographics.

Image Processing

The reverse-correlation task yielded 107 individual immigrant face images and 110 individual citizen face images (one for each participant in each condition). We used these "individual" images in the first image-rating experiment. The data also allowed for the creation of two average, or "group," face images, which we used in the second image-rating experiment. To do so, we again used the *rcicr* package to compile all the noisy images in each experimental condition, thereby revealing the average facial representation among our image generators for an immigrant and an American citizen (see Figure 2).
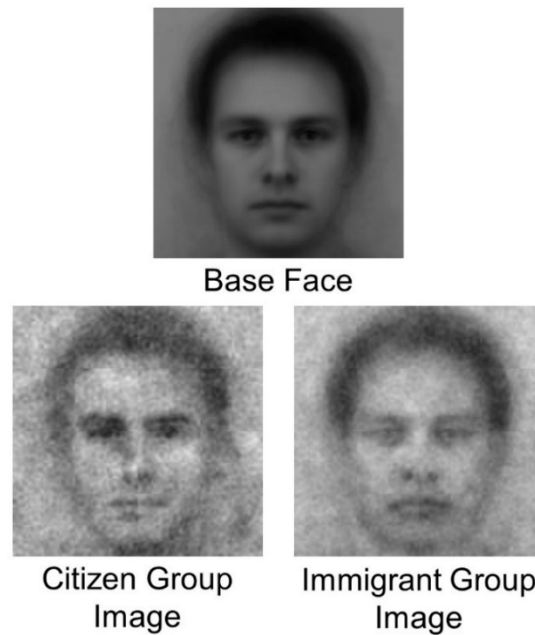
Figure 2. The base image and the two group images created in the image-generation experiment.

Image-Rating Experiment 1: Trait Ratings and Racial/Ethnic Classifications

In this first image-rating experiment, we tested for differences in the facial representations of immigrants and citizen. To do so, we recruited a new sample of participants who had no knowledge of how the images had been created to rate a subset of the individual immigrant and citizen images on trustworthiness, competence, or perceived race/ethnicity. We chose to evaluate trustworthiness and competence because both traits are directly related to

immigrant threat and to emotions commonly reported as being elicited by immigrant groups (Brader et al., 2008; Conzo et al., 2021; Cottrell & Neuberg, 2005).

Method

Participants (Image Raters)

We set a target sample size of around 100 participants per condition, or 300 total. Data collection continued until this target number was surpassed, resulting in a total of 327 participants. We excluded data from 37 participants who failed to complete the entire reverse-correlation task, leaving a final sample of 290 participants (57.2% women, 41.7% men, 1.0% nonbinary; 71.7% White, 10.7% Black, 7.9% Asian, 4.8% Latinx, 3.7% Multiracial; M_{age} = 37.6 years, SD = 11.9; some participants did not report their gender, race/ethnicity, or age). Because participants rated the images on only one of three dimensions (trustworthiness, competence, or perceived race/ethnicity), we used the number of participants in the smallest condition (n = 94) to estimate power. A sensitivity power analysis indicated that 94 participants affords 80% power to detect effect sizes as small as d_z = 0.30 (Faul et al., 2007). All participants were adults who were recruited from Amazon's Mechanical Turk and received $0.40 for their participation.

Materials

In this image-rating experiment, the images used were the 217 individual immigrant and citizen facial representations from the image-generation experiment. There were 107 immigrant representations and 110 citizen representations.

Procedure

Participants were randomly assigned to rate the images on one of three dimensions: trustworthiness (n = 97 participants), competence (n = 94), or perceived race/ethnicity (n = 99). Each participant rated a random 100-image subset of the 217 facial representations. Before

beginning, participants were urged to go with their "gut feelings" while rating them. Participants completed 7 practice trials to familiarize themselves with the task, and then rated each image assigned to them. For both the trustworthiness and competence ratings, participants rated the images using 7-point scales (1 = *extremely untrustworthy/incompetent*, 7 = *extremely trustworthy/competent*). Race/ethnicity classifications simply had participants select which race/ethnicity they believe the image most resembled. The options were African American, Asian, Latinx, Native American, or White.[1] Finally, participants reported demographics.

Results

The facial representations of immigrants ($M = 3.52$, $SD = 0.82$) were rated as less trustworthy than were the facial representations of citizens ($M = 3.82$, $SD = 0.82$), $t(96) = 8.13$, $p < .001$, $d_z = 0.83$. A similar pattern emerged on the competence ratings. The facial representations of immigrants ($M = 4.16$, $SD = 0.97$) were also rated as less competent than were the facial representations of citizens ($M = 4.49$, $SD = 0.99$), $t(93) = 7.52$, $p < .001$, $d_z = 0.78$.

Analyses on the race/ethnicity classifications revealed that the facial representations of citizens ($M = 0.68$, $SD = 0.26$) were more likely to be classified as White than were the facial representations of immigrants ($M = 0.57$, $SD = 0.26$), $t(98) = 8.00$, $p < .001$, $d_z = 0.80$. The facial representations of immigrants were more likely to be classified as each of the other races/ethnicities than were the facial representations of citizens—Latinx ($M = 0.20$, $SD = 0.17$ vs. $M = 0.16$, $SD = 0.16$): $t(98) = 3.81$, $p < .001$, $d_z = 0.38$; Asian ($M = 0.08$, $SD = 0.10$ vs. $M = 0.06$, $SD = 0.09$): $t(98) = 2.60$, $p = .011$, $d_z = 0.26$; African American ($M = 0.08$, $SD = 0.11$ vs. $M = 0.04$, $SD = 0.08$): $t(98) = 5.52$, $p < .001$, $d_z = 0.56$; and Native American ($M = 0.07$, $SD = 0.08$ vs. $M = 0.05$, $SD = 0.08$): $t(98) = 3.62$, $p < .001$, $d_z = 0.36$.

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[1] Regrettably, in the experiment itself, we used the label "Caucasian," which has roots in biological essentialist views of race. For this reason, the American Psychological Association recommends using the label "White."

Discussion

The results of this first image-rating experiment indicate that the immigrant facial representations were rated more negatively—less competent and less trustworthy—than were the citizen facial representations. These results hold true to negative stereotypes commonly associated with immigrant groups (Cottrell & Neuberg, 2005; Fiske, 2018; Mutz, 2018). Importantly, the image raters were "blind" to how the facial representations were created and had no knowledge of whether the images reflected immigrants or citizens, which suggests that the facial representations may capture biases operating in the minds of the image generators.

Furthermore, the immigrant images were more often classified as a race/ethnicity other than White, relative to the citizen images. More of the immigrant images were classified as Latinx than as any other non-White race/ethnicity. This latter finding is consistent with the demographics of the area where the participant sample was recruited: California's largest immigrant groups hail from Latin America (Johnson et al., 2021).

Image-Rating Experiment 2: Moderation by Implicit Attitudes toward Immigrants?

The goal of the second image-rating experiment was to examine the link between image generator's implicit attitudes toward immigrants and the facial representations they created. We used the immigrant SC-IAT scores of participants in the image-generation experiment to create higher-prejudice and lower-prejudice versions of the immigrant and citizen group images. Once again, we recruited a new sample of naïve participants to rate these group images on various traits (Oosterhof & Todorov, 2008) and to classify them by perceived race/ethnicity.

Method

Participants (Image Raters)

We aimed to collect data from at least 200 participants. Data collection continued until this number was surpassed, resulting in a total of 224 participants. We excluded data from 15 participants who failed to complete the entire experiment, leaving a final sample of 209 participants (70.8% women, 28.7% men; 45.9% Asian, 29.7% White, 16.3% Latinx, 3.3% Multiracial, 1.4% Black; M_{age} = 20.3 years, SD = 2.5; some participants did not report their gender, race/ethnicity, or age). A sensitivity power analysis indicated that this sample affords 80% power to detect effect sizes as small as η_p^2 = .037 (Faul et al., 2007). All participants were undergraduates at the University of California, Davis, who were recruited from a psychology subject pool and received partial course credit for their participation.

Materials

To create the higher-prejudice and lower-prejudice facial representations, we compiled all the images from participants who scored higher (+1 *SD*) or lower (-1 *SD*) on the immigrant SC-IAT from the image-generation experiment. This procedure produced an immigrant image and a citizen image for image generators with relatively less positive implicit attitudes toward immigrants (higher-prejudice) and an immigrant image and a citizen image for image generators with relatively more positive implicit attitudes toward immigrants (lower-prejudice; see Figure 3). Previous reverse-correlation research has used this "extreme-groups" approach to examine moderation by individual differences among image generators (e.g., Dotsch et al., 2008; Lei & Bodenhausen, 2017; Petsko et al., 2021).
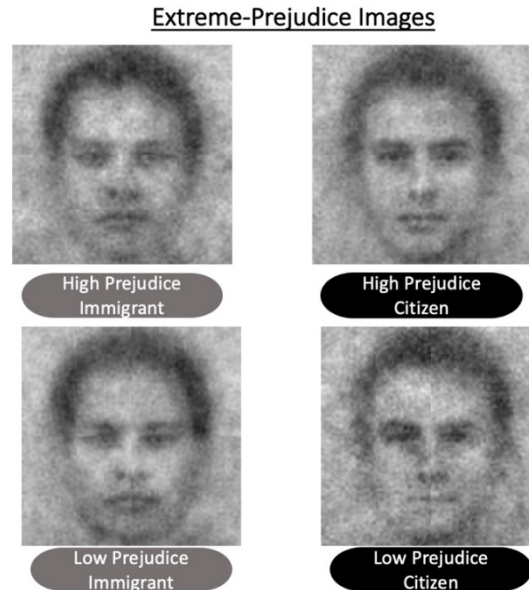
Extreme-Prejudice Images

High Prejudice Immigrant   High Prejudice Citizen

Low Prejudice Immigrant   Low Prejudice Citizen

Figure 3. Higher-prejudice and lower-prejudice immigrant and citizen group images.

Procedure

Participants who had no knowledge of how the facial representations were created rated all 4 images (in randomized order) on 6 traits taken from Oosterhof & Todorov (2008). These traits centered on positivity (*caring*, *trustworthy*, and *emotionally stabile*; α = .81) and dominance (*mean*, *aggressive*, and *dominant*; α = .83). Participants rated each trait using a 5-point scale (1 = *not at all*, 5 = *extremely*). Participants also classified the race/ethnicity of the images, using the same procedure as in the first image-rating experiment, except we removed the Native American category. Once again, participants were urged to go with their "gut feelings" while rating the images. Finally, participants reported demographics.

Results

Positivity

A 2 (Image Generator Prejudice: higher-prejudice, lower-prejudice) × 2 (Immigrant Status: immigrant, citizen) repeated-measures ANOVA on the positivity composite revealed a significant interaction, $F(1, 208) = 20.72$, $p < .001$, $\eta_p^2 = .09$. As displayed in the left panel of

Figure 4, the immigrant facial representation created by higher-prejudice image generators (M = 2.22, SD = 0.67) was rated less positively than was the immigrant facial representation created by lower-prejudice image generators (M = 2.39, SD = 0.69), $t(208)$ = 3.82, $p < .001$, d_z = 0.26, whereas the citizen facial representation created by higher-prejudice image generators (M = 2.83, SD = 0.82) was rated more positively than was the citizen facial representation generated by lower-prejudice image generators (M = 2.62, SD = 0.79), $t(208)$ = 3.14, $p = .002$, d_z = 0.22. Approaching this interaction differently, the pattern of intergroup bias on the positivity ratings (less positivity attributed to the immigrant vs. the citizen facial representation) was stronger for the facial representations created by higher-prejudice image generators, $t(208)$ = 8.57, $p < .001$, d_z = 0.59, than for the facial representations created by lower-prejudice image generators, $t(208)$ = 3.17, $p = .002$, d_z = 0.22, but it was significant for both.
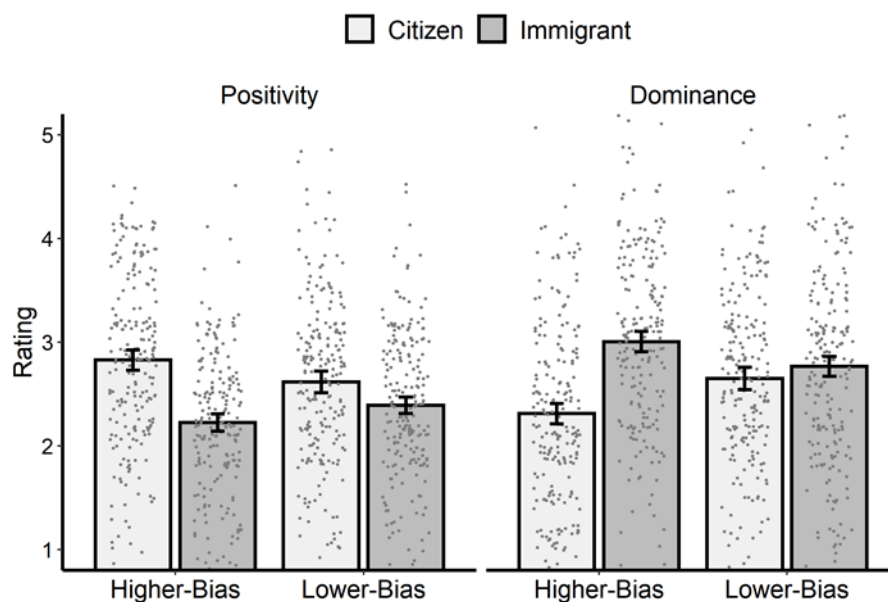
Figure 4. Positivity ratings (left panel) and dominance ratings (right panel) of the higher-prejudice and lower-prejudice image generators' immigrant and citizen group images in image-assessment Experiment 2. Error bars reflect 95% confidence intervals. Dots depict jittered individual data points.

Dominance

An identical 2 × 2 repeated-measures ANOVA on the dominance composite also revealed a significant interaction, $F(1, 208) = 51.71$, $p < .001$, $\eta_p^2 = .20$. As displayed in the right panel of Figure 4, the immigrant facial representation created by higher-prejudice image generators ($M = 3.00$, $SD = 0.87$) was rated as more dominant than was immigrant facial representation created by lower-prejudice image generators ($M = 2.76$, $SD = 0.91$), $t(208) = 4.31$, $p < .001$, $d_z = 0.30$, whereas the citizen facial representation created by higher-prejudice image generators ($M = 2.31$, $SD = 0.84$) was rated as less dominant than was the citizen facial representation created by lower-prejudice image generators ($M = 2.65$, $SD = 0.82$), $t(208) = 5.23$, $p < .001$, $d_z = 0.36$. Approaching this interaction differently, the pattern of intergroup bias on the dominance ratings (greater dominance attributed to the immigrant vs. the citizen facial representation) was significant for the facial representations created by higher-prejudice image generators, $t(208) = 9.49$, $p < .001$, $d_z = 0.66$, but not for the facial representations created by lower-prejudice image generators, $t(208) = 1.47$, $p = .144$, $d_z = 0.10$.

Race/Ethnicity Classifications

We next conducted separate 2 × 2 repeated-measures ANOVAs for each racial/ethnic category label. These analyses revealed significant interactions for three of the four race/ethnicity classifications: Asian, Black, and White. The patterns underlying these interactions was unexpected. In each case (see Table 1), the effect of immigrant status (i.e., the difference in the perceived race/ethnicity of the immigrant vs. the citizen facial representations) was *stronger* for the facial representations created by lower-prejudice image generators than for the facial representations created by higher-prejudice image generators.

Table 1

Race/Ethnicity Classifications by Immigrant Status and Image-Generator Prejudice in Image-Assessment Experiment 2

| Race/Ethnicity Label | Lower-Bias Image Generators | | Higher-Bias Image Generators | | *F* values | | |
	Citizen (*SD*)	Immigrant (*SD*)	Citizen (*SD*)	Immigrant (*SD*)	Immigrant Status	Prejudice	Immigrant Status × Prejudice
Asian	0.01 (0.12)	0.44 (0.50)	0.05 (0.21)	0.32 (0.47)	158.30***	3.91*	12.88***
Black	0.00 (0.00)	0.35 (0.48)	0.01 (0.07)	0.25 (0.44)	129.33***	6.74*	7.71**
Latinx	0.07 (0.26)	0.19 (0.39)	0.13 (0.34)	0.33 (0.47)	27.89***	15.64***	2.83
White	0.91 (0.28)	0.02 (0.15)	0.82 (0.39)	0.10 (0.30)	1706.82***	0.23	17.96***

****p < .001, **p < .01, *p < .05.*

Discussion

The results of this second image-rating experiment indicate that the reverse-correlation task can detect image generators' biases. These results also reveal how anti-immigrant bias, in particular, may shape people's facial representations of immigrants. Participants who had more prejudice toward immigrants generated immigrant facial representations that were less likely to be rated positively and more likely to be rated as dominant, relative to their citizen facial representations. Lower prejudice was also reflected in the generated images, in that the immigrant representations created by lower-prejudice image generators were rated as more positive and as less dominant than were those created by higher-prejudice image generators.

The results of the perceived race/ethnicity classifications suggest that higher-prejudice and lower-prejudice participants may imagine different groups when visualizing an immigrant.

Whereas the immigrant image generated by higher-prejudice participants was more frequently classified as Latinx and White, the immigrant image generated by lower-prejudice participants was more frequently classified as Asian and Black. Though unexpected, this finding could be an indication that lower-prejudice image generators may have relied less (and higher-prejudice image generators may have relied more) on well-known stereotypes about and media depictions of Latinx immigrants while generating their facial representations.

General Discussion

The current research investigated questions surrounding anti-immigrant attitudes and how they may shape facial representations of immigrants. We found some evidence that anti-immigrant attitudes do color the way in which immigrants are visualized. Facial representations of immigrants were rated more stereotypically, both in character traits (less competent, less trustworthy, and more dominant) and in perceived race/ethnicity (Latinx). These results advance the facial representation literature, by examining facial representations of an under-investigated group and by documenting how anti-immigrant attitudes can alter the generation of facial representations of this group.

Of course, this research is not without limitations. Most notably, the image generators were all undergraduate students residing in Davis, California. Davis has a unique immigrant landscape, with a higher mean immigrant population than most of the country. It would be beneficial for future research to replicate this work with more representative samples of image generators from other areas in the United States with different immigrant populations. For example, it would be of great interest to draw samples from the southwest United States, or the east coast where the makeup of immigrant populations is more varied. Furthermore, future research examining the potential downstream effects that immigrant facial representations may

have on a person's willingness to take political action, to vote on anti/pro-immigration policy, or to allocate resources to immigration-related causes, would also be greatly informative in understanding the consequences that people's facial representations may have outside the lab.

Immigration is a hot topic in today's political climate. The conversation and media coverage surrounding this issue contribute to how people formulate their attitudes. The current research investigated how those attitudes may shape the "pictures in our heads" of individuals from an immigrant group. Our findings suggest that they do, and that some people's visualizations are congruent with the stereotypically threatening way in which immigrants are commonly portrayed. Further research should be pursued to understand more fully whether and how facial representations of immigrants influence the way in which people evaluate and interact with immigrant populations.

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Appendix A

Words used in the Single-Category Implicit Association Test

List of 'good' words: *freedom*, *friends*, *fun*, *gifts*, *health*, *honesty*, *love*, *peace*, *success*, *vacation*.

List of 'bad' words: *abuse*, *cancer*, *enemy*, *failure*, *poison*, *pollution*, *rotten*, *stress*, *virus*, *vomit*.

List of 'immigrant' words: *immigrant*, *immigration*, *nonindigenous*, *nonnative*.