

Physical appearance and its effect on trust

Abril Ledesma, Denisse Kraut, Rubén Quezada, Atzin Zayas, María Elena Cano-Ruiz
Tecnológico de Monterrey High School, Cuernavaca, Mexico

SUMMARY

The first assessment of another person's trustworthiness may depend on several factors, such as previous experiences, education, cultural context, and prejudices, but also on the physical attributes and appearance of the person. We hypothesized that different physical traits would affect teenagers' initial trust of an unknown person and that they would give greater trust to women and people of similar ethnicity. To test this hypothesis, we developed a survey to determine the sets of physical characteristics that affect a person's trustworthiness, including gender, skin color/ethnicity, and facial expressions by asking teenagers to select pictures of young adults presented in pairs based on their physical appearance. For this, 52 teenage volunteers answered this survey in which each of the questions displayed two computer-generated images of people that represented hypothetical Uber drivers of the same age with different physical characteristics. The participants selected the person they preferred to have as an Uber driver based only on the images shown. Results indicated that female participants preferred women drivers, but male participants had no preference for the driver's gender. Mexican drivers were selected less than white or black drivers, and participants trusted a smiling expression over neutral expressions. We concluded that gender and expression were the main physical traits associated with how trustworthy an individual looks, and ethnicity was also important.

INTRODUCTION

Trusting others is essential for adequate social development, and many factors influence how people judge each other's trustworthiness. Trustworthy is defined as "deserving of trust, or able to be depended on" (1), and trust is defined as "to that someone is good and honest and will not harm you, or that something is safe and reliable" (1). Aspects such as emotional expressions, gender, and expected characteristics affect our perception of trustworthiness and when a person does not know someone, first impressions become important and can be triggered by initial physical appearance (2-6).

Social and psychological investigations have indicated the importance of physical appearance in social perception;

humans have evolved rapid, intuitive, and unreflective mechanisms for evaluating the interpersonal danger potential of other humans based solely on the physical attributes of their conspecifics (2). When referring to physical appearance, previous research has focused on facial characteristics using images of faces (not even including hair, neck, and ears) for testing trustworthiness based on physical appearance (3). People tend to form judgments about how attractive, likable, or even trustworthy others could be as a way to plan their behavior, yet there is not a concise understanding of what the specific characteristics are that make someone look trustworthy.

Whenever something is typical it "shows all the characteristics that would be usually expected from a particular group of things" (1). This virtue leads to a psychological effect, known as typicality, where "people are quicker to make category judgments about typical members of a category than they are to make such judgments about atypical members" (7). Some research suggests that typical faces influence trustworthiness since these faces were judged as safer and more trustworthy (4). In a study where a computer modified a typical face into more extreme appearance trustworthiness decreased as the distance of computer-generated faces from the typical face increased; the more atypical the faces, the more untrustworthy they were perceived to be (8). As such, the face is an important determinant of perceived trustworthiness; as a face becomes more attractive or more unattractive, the trustworthiness decreases (3). This may be because typical faces are perceived as more familiar. Familiarity is referred to a feeling of recognition in the memory, not specifically recalled but remembered (1), which makes familiar features more likable and judged as safe (4, 9-10). The high level of perceived trustworthiness of the typical face likely arises from the inherent preference for typicality, which can be mediated by familiarity (3). It is important to remark that every nation has its typical face that derives from both the ideal face of the nation and the most consensually familiar face in a population (11). Individuals show greater trust in those belonging to groups that they favor but do not necessarily favor the group or ethnicity to which they belong (12).

Emotional expressions affect judgments of trustworthiness as well (2). Subtle happy expressions, such as smiling, increase the likelihood of a trustworthy judgment (3). People inferred that smiling individuals are extraverted, kind, and open to experience (10). In contrast, subtle anger cues and

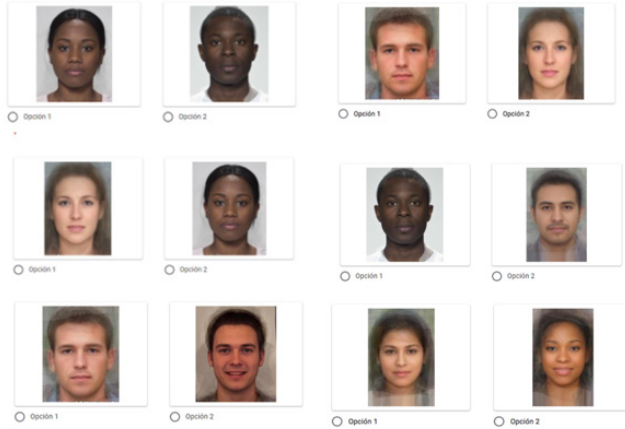


Figure 1. Examples of computer-generated images of hypothetical Uber drivers used in the survey. 1st row: gender preferences - pairs 1 (black female - black male) and 2 (white male - white female); 2nd row: skin color/ethnicity preferences - pairs 3 (white female - black female) and 4 (black male- Mexican male); 3rd row: facial expression preferences - pairs 5 (white neutral male – white smiling male) and 6 (Mexican neutral female – black smiling female).

emotionally neutral faces are perceived as untrustworthy (3).

In addition to familiarity and emotional expressions, gender may also influence trustworthiness. Women or faces with feminine cues evoke more trust than men and masculine cues, especially for women (5). Gender plays a role in trust behavior: men are on average more trusting and women more trustworthy (13). This also occurs in adolescents; boys are more trusting than girls, but no perceived gender difference in trustworthiness for adolescents has been observed (6).

This study investigated three components of trustworthiness in Mexican teens: gender, skin color/ethnicity (used as a surrogate for familiarity), and facial expression, using computer-generated faces with different traits. We hypothesized that the physical appearance of an individual will affect whether others trust them and that feminine and Mexican traits will be preferred by Mexican teenagers.

RESULTS

Our study included 52 teenage volunteers (27 females, 25 males) with an average age of 17 years (Table 1). All participants were Mexican from an urban area attending the same private high school. The survey displayed a total of 35 questions and was administered in two parts. The first part contained 13 questions, and the second contained the remaining questions four months later. The survey was carried out in two parts since in the first survey the interactions between facial expression with gender and ethnicity were not addressed. Each question in both surveys

Table 1. Demographic data of participants

Gender	Sample size	Mean age (years)	Standard deviation (years)
Female	27	17.4	1.1
Male	25	17.9	1.3
Total	52	17.7	1.2

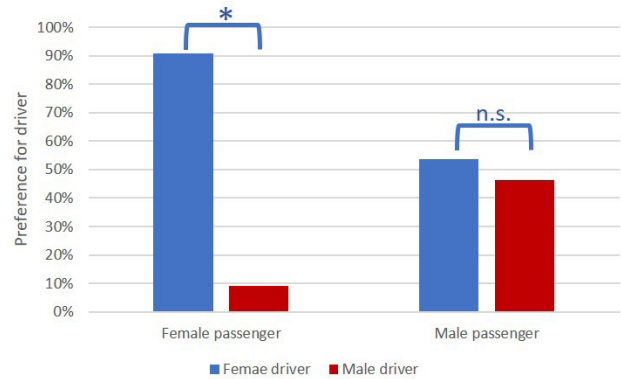


Figure 2. Preference for a female or male driver according to the gender of the passenger. There was a statistical dependence between the gender of the driver and the gender of the passenger (Chi-squared test, $df_1=1$, $df_2=1$, $N=52$, $*p\text{-value} < 0.005$) with female passengers preferring female drivers over male drivers but no preference for male passengers.

showed two images of people who represented hypothetical Uber drivers with different gender, skin color/ethnicity, and/or facial expression (Figure 1). We obtained the images of hypothetical Uber drivers through Face Research (14), an online software that generates images of the average faces of men and women, and we used these generated average faces (not real people’s faces) to represent different physical traits of young people in their twenties. The participants were asked, based only on the images shown, to choose the person in the pair presented they preferred as a hypothetical Uber driver. In total, each participant made 34 selections plus a final open question indicating motives for their selections.

Table 2 shows the main motives indicated by participants for Uber driver selection. There are important differences between motives for female and male teenagers (referred to as passengers henceforth). Gender and trust for selecting a driver are more important for female passengers than for male passengers, and quality of the image, which participants associated with professionalism and service quality, was more important for male passengers. Although the images of Uber drivers were computer-generated, a few images seemed less sharp than others, resulting in a confounding factor associated by passengers with professionalism.

A difference in the preference for the gender of Uber drivers depending on the gender of the passenger was evident. This preference was statistically significant (Chi-squared test, $df_1=1$, $df_2=1$, $N=52$, $p\text{-value} < 0.005$), indicating

Table 2. Motives for selecting hypothetical Uber Driver according to passenger’s gender

Motives	Female passengers	Male passengers
Gender	26%	4%
Trust	33%	15%
Kindness/smile	26%	37%
Quality image/professionalism	7%	26%
Other	4%	11%

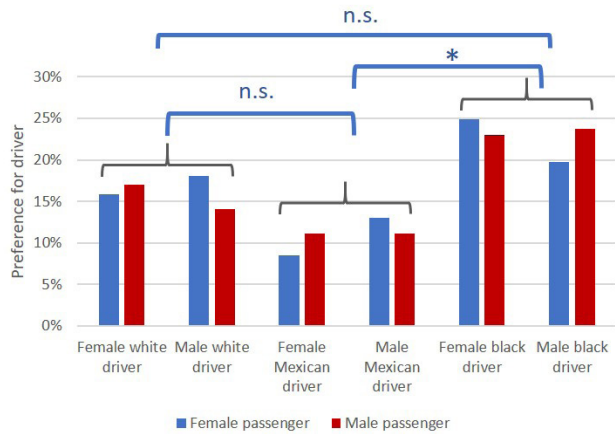


Figure 3. Preference of passengers for different ethnicity of drivers. There was a statistical difference due to skin color/ethnicity with male and female passengers selecting more black drivers over Mexican drivers (Chi-squared test, $df=2$, $N=52$, $*p$ -value < 0.046).

that female passengers prefer having female drivers, whereas male passengers did not have a preference for drivers based on gender (Figure 2). In most cases, female passengers preferred female drivers, whereas male passengers had no preference, independent of skin color/ethnicity.

For skin color/ethnicity preferences of the drivers, no statistical differences were found (Chi-squared test, $df_1=1$, $df_2=2$, $N=52$, p -value > 0.099) that indicated a skin color/ethnicity preference was affected by the gender of the passengers. But there was a statistical difference (Chi-squared test, $df=2$, $N=52$, p -value < 0.046) in hypothetical Uber drivers' selection due to their ethnicity. Black drivers were selected preferably over white or Mexican drivers within the same gender and Mexican drivers were the least favored (Figure 3).

We also analyzed the influence of facial expressions

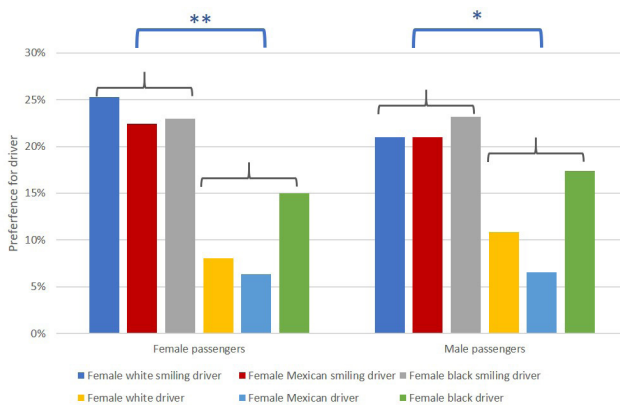


Figure 5. Preferences of passengers for smiling vs. neutral facial expressions for female drivers with different skin color/ethnicity. There was a statistically significant difference for smiling over neutral expressions by female passengers (Chi-squared test, $df=1$, $N=27$, $**p$ -value = 0.021) and male passengers (Chi-squared test, $df=1$, $N=25$, $*p$ -value = 0.045).

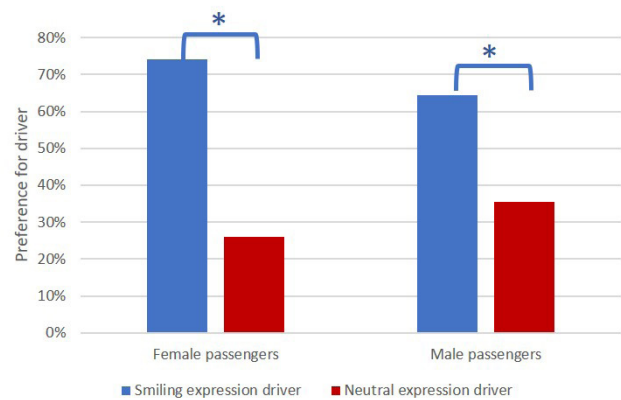


Figure 4. Preference of passengers for smiling vs. neutral facial expressions of drivers of the same gender and skin color/ethnicity. There was a statistically significant difference (Chi-squared test, $df=1$, $N=52$, $*p$ -value < 0.006) by male and female passengers.

on preference for hypothetical Uber drivers and found no differences in hypothetical Uber driver selection due to passenger's gender (Chi-squared test, $df_1=1$, $df_2=1$, $N=52$, p -value > 0.094) and passengers preferred drivers with smiling expressions over neutral expressions when controlling for skin color/ethnicity and gender (Chi-squared test, $df=1$, $N=52$, p -value=0.006) (Figure 4). When the gender of the driver was controlled but skin color/ethnicity was not, both female passengers (Chi-squared test, $df=1$, $N=27$, p -value=0.021) and male passengers (Chi-squared test, $df=1$, $N=25$, p -value=0.045) still preferred smiling female drivers over neutral expression female drivers (Figure 5). Male passengers also selected more smiling male drivers (Chi-squared test, $df=1$, $N=25$, p -value=0.045), but there was no statistical difference for female passengers in their selection of male drivers (Chi-squared test, $df=1$, $N=27$, p -value=0.248) because of their facial expression (Figure 6).

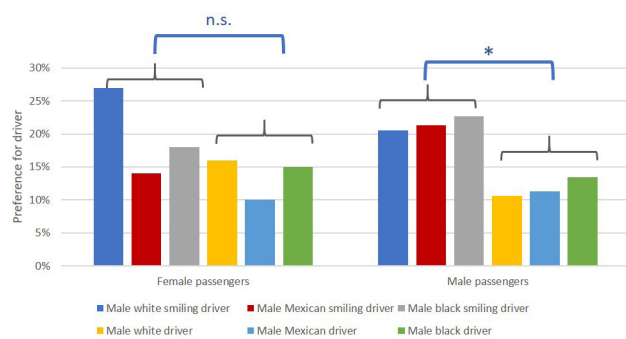


Figure 6. Preference of passengers for smiling vs. neutral facial expressions for male drivers with different skin color/ethnicity. There was a statistically significant difference for smiling over neutral expressions by male passengers (Chi-squared test, $df=1$, $N=25$, $*p$ -value = 0.045), but not for female passengers (Chi-squared test, $df=1$, $N=27$, p -value = 0.248).

When facial expression of the drivers was tested without controlling for skin color/ethnicity and gender, female passengers preferred female drivers independent of the facial expression (75% of the time), while male passengers did not show any evident preference, showing in almost all cases 50/50 chances for selecting between the pair presented. An exception for male passenger selection happened when a Mexican driver was present; regardless of their gender or facial expression, male passengers favored the other driver (Chi-squared test, $df=1$, $N=25$, p -value = 0.033).

DISCUSSION

The applied surveys comparing two hypothetical Uber drivers with different physical traits (**Figure 1**) found differences in passengers' preference due to drivers' gender, skin color/ethnicity, and facial expression. The main reasons stated by participants for driver selections (**Table 2**) showed the differences between male and female teenagers when considering taking an Uber service. While females are more worried about security, reflected in gender and trust, males are more concerned about the quality of the service.

For gender influence, female passengers indicated more trust in female drivers than male drivers (**Figure 2**), whereas men did not consider gender as an important factor for selecting the driver. These results support previous investigations that expressed that women's faces are more trustworthy (3, 5). Our results agree with this statement in that female drivers were significantly preferred over male drivers by female passengers (**Figure 2**). Sociocultural and evolutionary perspectives have been used to explain this (5). Interpersonal, facilitative, and friendly behavior has been associated with female gender roles socially, whereas instrumental, more outcome-based roles have been associated with males, therefore associating female roles as more altruistic and thus more trustworthy (6, 15). From the evolutionary perspective, females (especially mammals) spend more time raising offspring and need to be more selective when choosing a partner, therefore women tend to be more careful in whom they trust (6). However, because females are more selective in their partners, males need to evolve more competitively and engage in risky behavior making them less trustworthy (16), but generally more trusting of others to have a better chance to establish relationships and cooperation within a group (6, 16). It is also important to consider the social context of Mexico, where ten women are murdered every day, and the rate of female homicides has doubled in the last five years (17). Most of these crimes are perpetrated by men, and it is commonly known that a modus operandi of some of these murders is through kidnapping and abusing the victim while they are traveling via ride services such as Uber. This is probably less concerning for male passengers, who are less likely to be victims of this type of crime, therefore explaining why men show no preferences concerning driver gender. For female teenagers answering the survey, this factor may increase the fear towards male

drivers, leading to increased trust in female drivers.

When it comes to ethnicity, we discovered two interesting results. First, we expected that participants would choose Mexican drivers more than black or white drivers by identification with the Mexican faces since passengers were Mexican, but this was not the case. Second, black faces seemed to be preferred over the other choices. Familiar faces tend to be affable and judged as safe (4, 10). In this case, the most familiar face was believed to be the Mexican drivers; however, participants did not choose a face of their ethnicity, and black faces seem to be preferred (**Figure 3**). This difference in preference for black drivers over white and Mexican drivers, regardless of the passengers' gender, should be considered with caution. One explanation is that the survey was answered by teenagers with a mean age of 17.7 years old, who belong to the "gen Z" or "centennials" generation and are more used to seeing different ethnicity representations in social media. Being in touch with other cultures has made the younger generations much more tolerant of diversity compared to older generations (18-19). In Mexico, skin color varies from white to dark brown, but very few people are considered black, and in the area where this survey took place, black people are very unusual. Another possible explanation is that volunteers from the high school where this survey took place also have been educated in a multicultural environment that aims to form global citizens, this education develops a tolerant vision through classes like history and civics and international exchanges aimed for students to learn and respect different cultures and ethnicities, which could, in turn, explain that participants did not want to be perceived as racially prejudiced. Still, this is a theoretical scenario that needs to be challenged with real-life experiments. Most intriguing was the result that Mexican drives of both genders were selected less over white or black drivers. This can be explained by a cultural construct in Mexico, known as "malinchism". Malinchism is defined as an attraction for foreign values and aversion to your own culture (20). The term comes from the historic figure, "La Malinche," an indigenous woman advisor and lover of Spanish conqueror Hernán Cortés, who stood with the Spanish conquistadors assisting them to defeat the Aztec empire. This result, where Mexican participants frequently rejected Mexican drivers, is an example of internalized racism that has a powerful influence on thoughts and actions but is unconscious (21). Although Mexicans do not recognize themselves as racists, this internal racism against indigenous people exists and is very common (22). Still, the sample size was small (52 participants), and the participants all came from an urban private high school from the middle-upper class economic background, which does not represent the heterogeneity of the Mexican population.

Concerning facial expression, smiling drivers were selected moreover drivers with neutral expressions (**Figure 4**) when controlling for gender and skin color/ethnicity. This finding could support the idea that smiling is important

for building social trust (23), which is also associated with kindness (**Table 2**). It is worth mentioning that people make judgments based on facial expressions since emotional expressions are a common way to know people's behavioral intentions. Typically, people with happy expressions are perceived as approachable, while individuals who show an angry expression are seen as people who should be avoided (2). When gender was controlled but not skin color/ethnicity, both male and female participants preferred, in general, smiling expressions over neutral expressions of the drivers (**Figures 5 and 6**), which is also seen in the motives indicated for selecting drivers (**Table 2**), where a smile is associated with kindness. However, for female passengers there was no statistical difference in preference of smiling male drivers over neutral expression male drivers (**Figure 6**) which can be a result of the small sample size. When facial expression was tested but with no control of gender or skin color/ethnicity, female teenagers still preferred female drivers regardless of their facial expression, confirming they trust more women, but males show no preferences, except where the "malinchism" effect was present and teenage males preferred other drivers instead of Mexican drivers, independent of facial expression.

There are certain patterns when it comes to physical characteristics that make someone trustworthy. In this study, gender, ethnicity, and facial expression were determinants of trustworthiness for Mexican teenagers. The use of experiments and participants with a wide age range and socioeconomic background is recommended to improve this study. A social experiment where passengers, before selecting their Uber driver, can see the pictures of two or more drivers and then make their selection using only the pictures of drivers will give us more insight into how physical appearance affects trust in others. Doing social experiments is important since surveys are not always good representations of real conditions and can influence real behavior.

METHODS

We designed a survey in Google Forms. The survey was anonymous and only personal questions of gender and age were asked. We asked 52 high school teenage volunteers (27 females, 25 males) with ages ranging from 16 to 20 years old to participate in answering the survey in a private environment.

The survey had a total of 35 questions: 13 questions were administered first, and four months later, the rest of the questions were answered by the same volunteers. Each question displayed two images of people who represented hypothetical Uber drivers (**Figure 1**), except for the last question which was an open question asking participants to explain their motives for selecting the drivers. The images of the people were created through Face Research online software (14) that generates images of average faces of men and women with different physical traits (but are not faces of real people). The images were selected for the survey to display different physical characteristics, such as gender

(male or female), skin color/ethnicity (white, Mexican, or black), and facial expression (neutral or smile), but looked the same age (in their twenties). For gender preferences, four questions (three on the first survey and one on the second survey) were used with different gender but controlling for ethnicity and facial expression (neutral) for each pair. For skin color/ethnicity preferences, six questions (all six on the first survey) were used varying ethnicity but controlling gender and facial expression (neutral) in each pair. Finally, for facial expression discrimination, a total of 24 questions were used (4 on the first survey, the rest on the second survey), and some were controlled for gender or skin color/ethnicity but not all. Participants were forced to discriminate four times for gender preferences, six times for skin color/ethnicity preferences, six times for facial expression preferences balancing for gender and skin color/ethnicity, twelve times for facial expression preferences balancing for gender but not skin color/ethnicity, and finally six times for facial expression preferences not balancing gender or skin color/ethnicity. Participants were asked, based only on the image shown, to choose the person that they want to have as a driver for each pair shown. Questions were randomly arranged according to preference trait: gender, ethnicity, or physical expression, but were presented in the survey in the same order for each participant. Last, an open question asked participants to indicate their motives for selecting the different hypothetical drivers. Participants did not know the images were computer generated and believed they belonged to real Uber drivers.

The data were analyzed using the chi-square test of independence and chi-square test of goodness of fit using a significance level of 0.05, and the chi-square test function from Microsoft Office Excel, 2020. Chi-square tests of independence were used for each question to test if the passenger's gender was related to Uber driver selection according to the three variables tested: gender, ethnicity, and facial expression of the driver. When no statistical differences in Uber driver selection were found due to passenger's gender, chi-square tests of goodness of fit were done pooling the questions that tested the variable of the Uber driver being evaluated: ethnicity or facial expression, and dividing the counts in each category by the number of questions used so that proportions of selections were compared keeping participants as the independent variable, with N=52 for each chi-squared goodness of fit test.

ACKNOWLEDGMENTS

The authors would like to thank the students of our high school that participated in answering this survey.

Received: May 19, 2020

Accepted: October 8, 2020

Published: November 9, 2020

REFERENCES

1. Cambridge Dictionary. "Trustworthy." *Cambridge Dictionary*, 2020, dictionary.cambridge.org/dictionary/english/trustworthy.
2. Oosterhof, N. N., and A. Todorov. "The Functional Basis of Face Evaluation." *Proceedings of the National Academy of Sciences*, vol. 105, no. 32, 2008, pp. 11087–11092., doi:10.1073/pnas.0805664105.
3. Sofer, Carmel, et al. "What Is Typical Is Good." *Psychological Science*, vol. 26, no. 1, 2014, pp. 39–47., doi:10.1177/0956797614554955.
4. Zebrowitz, Leslie A., et al. "The Contribution of Face Familiarity to Ingroup Favoritism and Stereotyping." *Social Cognition*, vol. 25, no. 2, 2007, pp. 306–338., doi:10.1521/soco.2007.25.2.306.
5. Mattarozzi, Katia, et al. "Effects of Gender and Personality on First Impression." *Plos One*, vol. 10, no. 9, 2015, doi:10.1371/journal.pone.0135529.
6. Derks, Jeffrey, et al. "Adolescent Trust and Trustworthiness: Role of Gender and Social Value Orientation." *Journal of Adolescence*, vol. 37, no. 8, 2014, pp. 1379–1386., doi:10.1016/j.adolescence.2014.09.014.
7. APA Dictionary of Psychology. "Familiarity". *American Psychological Association*, 2020.
8. Todorov, Alexander, et al. "Social Attributions from Faces: Determinants, Consequences, Accuracy, and Functional Significance." *Annual Review of Psychology*, vol. 66, 2015, pp. 519–545., doi:10.1146/annurev-psych-113011-143831.
9. Bartlett, James C., et al. "Typicality and Familiarity of Faces." *Memory & Cognition*, vol. 12, no. 3, 1984, pp. 219–228., doi:10.3758/bf03197669.
10. Halberstadt, Jamin and Gillian Rhodes. "It's Not Just Average Faces That Are Attractive: Computer-Manipulated Averageness Makes Birds, Fish, and Automobiles Attractive." *Psychonomic Bulletin & Review*, vol. 10, no. 1, 2003, pp. 149–156., doi:10.3758/bf03196479.
11. Galton, Francis. "Inquiries into Human Faculty and Its Development." 1919, doi:10.1037/10913-000.
12. Stanley, D. A., et al. "Implicit Race Attitudes Predict Trustworthiness Judgments and Economic Trust Decisions." *Proceedings of the National Academy of Sciences*, vol. 108, no. 19, 2011, pp. 7710–7715., doi:10.1073/pnas.1014345108.
13. Ben-Ner, Avner, and Freyr Halldorsson. "Trusting and Trustworthiness: What Are They, How to Measure Them, and What Affects Them." *Journal of Economic Psychology*, vol. 31, no. 1, 2010, pp. 64–79., doi:10.1016/j.joep.2009.10.001.
14. DeBruine, Lisa and Ben Jones. "Face Research: Experiments about face and voice perception", *Face Research*, www.faceresearch.org.
15. Eckes, Thomas, and Hanns Martin Trautner. *The Developmental Social Psychology of Gender*. Lawrence Erlbaum Associates, 2000.
16. Balliet, Daniel, et al. "Sex Differences in Cooperation: A Meta-Analytic Review of Social Dilemmas." *Psychological Bulletin*, vol. 137, no. 6, 2011, pp. 881–909., doi:10.1037/a0025354.
17. Sandin, Linnea. "Femicides in Mexico: Impunity and Protests." *Center for Strategic and International Studies*, 19 Mar. 2020, www.csis.org/analysis/femicides-mexico-impunity-and-protests.
18. Llaneras, Kiko, et al. "La Generación Que Desbanca a Los 'Millennials'." *El País*, 20 Aug. 2018, elpais.com/internacional/2018/08/19/actualidad/1534683555_936952.html.
19. Rothman, Darla. "A Tsunami of learners called Generation Z." *www.mdle.net/JoumaFA_Tsunami_of_Learners_Called_Generation_Z.pdf*, 2016.
20. Dantas Alexis Toribio, and Maria Teresa Toribio Brittes Lemos. *América: visões e versões, Identidades Em Confronto*. 7 Letras, 2010.
21. Leff, Jacqueline Fortes De. "Racism in Mexico: Cultural Roots and Clinical Interventions1." *Family Process*, vol. 41, no. 4, 2002, pp. 619–623., doi:10.1111/j.1545-5300.2002.00619.x.
22. Moreno Figueroa, Monica G. "Naming Ourselves: Recognising Racism and Mestizaje in Mexico". *Contesting Recognition. Identity Studies in the Social Sciences*. Edited by J. McLaughlin et al., Palgrave Macmillan, London, 2011, pp. 123-125., doi.org/10.1057/9780230348905_7
23. Centorrino, Samuele, et al. "Honest Signaling in Trust Interactions: Smiles Rated as Genuine Induce Trust and Signal Higher Earning Opportunities." *Evolution and Human Behavior*, vol. 36, no. 1, 2015, pp. 8–16., doi:10.1016/j.evolhumbehav.2014.08.001.

Copyright: © 2020 Ledesma et al. All JEI articles are distributed under the attribution non-commercial, no derivative license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>). This means that anyone is free to share, copy and distribute an unaltered article for non-commercial purposes provided the original author and source is credited.