Original Paper

Can I trust you?
Differentiating contributions of stereotypes, gender, and faith in others

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Abstract *Stereotypes are common and often harmful social heuristics that emerge through largely-untrue generalizations about a group of people from other social or cultural groups. Stereotypes can lead to prejudice, stigma, and poor mental health for affected individuals. Across cultures, people are classified by their skin color, apparent gender, or other superficial features that are related to stereotypes, but completely unrelated to individual character traits, such as trustworthiness. This study examines whether new information can override snap judgements about skin color and apparent gender, and if faith in others may mediate stereotypes. Our study mimicked real life by introducing participants (N = 121) to artificially-colored images of human faces (blue versus red faces) who looked male or female and to stereotyping information about one of the colors that were either negatively or positively phrased. Participants indicated how much they trusted group members and completed a self-rated scale regarding general faith in others. This study found that the stereotyping information could effectively bias participant ratings, regardless of what color face they initially preferred, F(3,117) = 11.26, p <0.001. Furthermore, participants were more likely to trust female faces regardless of the color, F(1,119) = 27.83, p < 0.001. Marginal evidence revealed that general faith in others contributes to stereotype formation. Factor analysis was performed to further interrogate the findings. Relevance to Cultural Psychiatry and Global Mental Health, and suggestions for future directions are discussed.*

Keywords: Trustworthiness, Stereotypes, Gender, Faith, Social Interaction.

INTRODUCTION

The use of stereotypes has been observed across countless eco-cultural settings with commonalities in their construction and applications (Cuddy et al.,

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2009). Stereotypes negatively contribute to mental health outcomes, and disproportionately affect local minority and migrant groups (Stathi, Tsantila, & Crisp, 2012). How to mitigate stereotyping has been a topic of discussion among transcultural and global mental health communities. Past studies have not examined whether positive group stereotypes have the same influence as negative stereotypes. This study examines the relationship between superficial physical traits (skin color, apparent gender) and whether information about a groups' trustworthiness can override initial biases. People who have more faith in others may also be receptive to revising their first impressions relative to the general public; therefore, the role of individual differences in how much faith someone has in others is also examined.

Judging an individual's trustworthiness is a rapid process that occurs spontaneously (Leung & Wincenciak, 2019; Todorov & Uleman, 2002). It only takes 100 milliseconds of exposure to a face to decide if that individual is trustworthy (Olivola & Todorov, 2010; Todorov, 2008; Willis & Todorov, 2006). When looking at a face, skin color is obvious immediately. Therefore, this autonomic process is also used when judging specific stereotypical groups (Leung & Wincenciak, 2019). A stereotype is defined as attributing specific characteristics to a group (Kurylo, 2012). Furthermore, race is inferred the fastest and activation is associated with memory among others (Kidder et al., 2018), thus creating and activating stereotypes unreflectively. Stereotypes can function as cognitive heuristics, i.e., shortcuts where appearance is used to judge a group, and thereby also the trustworthiness of that group and its group members (Prati et al., 2015). This requires a lower cognitive load but can result in overgeneralizations, erroneous stereotypes, and negative consequences. In addition to stereotypes, gender or generalized faith in others may also act as cognitive heuristics when making snap judgements about the trustworthiness of a stranger. In the case of faith, the heuristic may not be applied to a group of people but rather about the trustworthiness of people in general. Using non-natural skin colors and a repeated measures design, the present study investigates the roles of stereotyped information in automatic, unconscious associations with skin color and the relative contributions of generalized faith during snap judgments about strangers.

Trust and trustworthiness are often intertwined to explain the dynamic between the trustor   and trustee. The specific definitions of trust and trustworthiness vary according to the contexts they are being used in (Kumar et al., 2020). The trustor decides to be vulnerable to the trustee despite knowing that the trustee may deceive them (Kumar et al., 2020; Özer & Zheng, 2017). Thus, trust is directed at and depends on the trustor's capability to be vulnerable in situations where the trustee's behavior is unobservable. Trustworthiness, on the other hand, is characterized as not taking advantage of the trustor's vulnerability even in a situation where the trustee's egoistic motivation is contradicting with the intent of the trustor (Özer & Zheng, 2017). Hence,

trustworthiness depends on the trustee's moral nature not to betray the trustor's trust. Such a betrayal leads to a reputation as untrustworthy.

However, snap judgements about who can be trusted often rely on heuristics in place of factual evidence or experience with the trustee (Leung & Wincenciak, 2019; Dale, 2015; Hinton, 2017). For example, studies using various facial traits and performed across numerous populations have demonstrated that facial similarity contributes to a strong in-group effect and higher ratings of trustworthiness (Ewing et al., 2019; Sofer et al., 2017; Dovidio et al., 1986; Gaertner & McLaughlin, 1983). Such heuristics are relied upon most heavily during snap judgements (Hughes et al., 2017).

Although heuristics may be a strong contributor to snap judgements about trustworthiness, numerous studies have demonstrated that prejudices and negative stereotypes can be reduced by introducing new information (Maister et al., 2015; Peck et al., 2013; Shih and Gutiérrez, 2013; Stangor et al., 2001; Finlay and Stephan, 2000). Gender can also be a mitigating factor. Women are generally perceived as more trustworthy than men across situations (Shockley-Zalabak et al., 2019; Kidder et al., 2018; Aggarwal et al., 2015).

Group stereotypes about trustworthiness may interact with general faith in others. Faith is a type of generalized trust which is not directed at specific individuals or groups, but people in general (Uslaner, 2016). This way of trusting stems from the view that individuals share the same moral values. Low faith in others may contribute to more negative group stereotypes while high faith in others may have the opposite effect (Prati et al., 2015; Robbins, 2016).

In this study, participants act as the trustors and three hypotheses are investigated. Hypothesis 1 (H1) predicts that a stereotype will form when providing the trustors with personality traits related to a target group. Thus, when a trustor receives negative information about one group, the trustor will rate everyone within that group as less trustworthy and the reverse for positive traits. Hypothesis 2 (H2) predicts that women are perceived as more trustworthy than men regardless of the trustors' gender. Hypothesis 3 (H3) predicts that participants' general faith in others influences how trustworthy they find the trustees.

METHODS

Participants
Participants were recruited through English-language survey exchange global Facebook Groups designed to facilitate data collection for student theses. Participants acknowledged that participation was voluntary, unpaid, and read and signed informed consent using a virtual form prior to beginning study procedures. One hundred and twenty-eight healthy participants enrolled in this

study. A sample of this size can detect a minimum effect size f = 0.107 at α = 0.05 with   80% power based on a repeated measures ANOVA (within factors) sensitivity power analysis (Fritz et al., 2012). Seven participants were excluded for selecting the same response or systematically alternating responses to each question, resulting in a total of 121 participants   included in the final analysis (77.69% female, 22.31% male) (Table 1). Participants spoke 30   different native languages and only 28% had English as their native language (i.e., 34 out of 121). This study was conducted in compliance with the Declaration of Helsinki and approved by The   Central Denmark Region Committees on Health Research Ethics.

Table 1. Demographics for all conditions.

	NSBG (n = 29)			NSRG (n = 32)			PSBG (n = 33)			PSRG (n = 27)		
	M	SD	Range	M	SD	Range	M	SD	Range	M	SD	Range
Age	26.69	7.27	20-52	35.50	6.33	20-50	24.67	4.03	19-37	26.22	7.19	20-52
Gender	82.76% female (n = 24), 17.24% male (n = 5)			78.13% female (n = 25), 21.88% male (n = 7)			69.70% female (n = 23), 30.30% male (n = 10)			81.48% female (n = 22), 18.52% male (n = 5)		

Note: NSBG = Negative Stereotypes about the Blue Group, PSBG = Positive Stereotypes about the Blue Group, NSRG = Negative Stereotypes about the Red Group, PSRG = Positive Stereotypes about the Red Group; M = mean; SD = standard deviation.

Stimuli

Eighty validated, neutral faces (50% female) were randomly selected from The Face-Place Face Database (version 2.0.3)'s category of white individuals (Ma et al., 2015). Red (HEX color High Red ff0000) and blue (HEX color High Blue 0000ff) color filters were separately applied to each face to represent skin-based racial categories while avoiding existing racial biases using Photopea (https://www.photopea.com/). The colors correspond to the primary colors optimized for screen displays. Each face was used twice, resulting in 80 red faces and 80 blues faces (Figure 1). Relevant   facial characteristics were characterized by 1,087 volunteers (Ma et al., 2015) and are reported in Table 2.

Figure 1: Examples of facial stimuli from the experiment. Faces were extracted from The Face-Place Face Database (version 2.0.3) and recolored using HEX primary colors. Stimulus images courtesy of Michael J. Tarr, Center for the Neural Basis of Cognition and Department of Psychology, Carnegie Mellon University, http://www.tarrlab.org/. Funding provided by NSF award 0339122. Stimulus images are licensed under the Attribution-NonCommercial-ShareAlike 3.0 Unported (CC BY-NC-SA 3.0), which permits modification and publication.

Participants were divided across four experimental groups, which varied according to the Stereotype Information that they read about each facial color (Stimuli Color). Stereotype-based person perception is largely defined by perceived honesty/dishonesty and morality/immorality (Brambilla et al., 2014, 2012; Goodwin, 2015; Leach, Bilali, & Pagliaro, 2015). Therefore, the Stereotype Information that participants read defined the honesty/dishonesty and morality/immorality of each facial color as either Positive or Negative (see Supplementary Materials).

The Faith subscale of the General Trust Scale was used to establish participants' General Faith (Rempel et al., 1985). A trustor uses his or her faith in others to judge an individual in situations where past experiences cannot be relied on, and the Faith subscale was designed to capture situations without prior experiences (ibid.). Participants rated statements on a scale of 1 to 7 with (1 = "strongly disagree," 7 = "strongly agree"). Scores were calculated by summing the scalar responses to each statement for each participant, providing an individual General Faith score. Then the mean thereof, which was found to be 39, was used to divide the participants into categories. Thus, an individual trust score of 39 or below resulted in Low Faith in others, and above 39 resulted in High Faith in others.

Table 2. Age and characteristics for male and female stimuli

	Females (n = 40)			Males (n = 40)		
	M	*SD*	*Range*	*M*	*SD*	*Range*
Age	27.66	5.72	19-35	28.78	6.16	16-43
Attractiveness	3.57	0.87	1.72-5.48	3.00	0.58	2.04-4.66
Prototypicality	3.56	0.78	1.76-4.84	3.54	0.74	1.77-4.29
Trustworthiness	3.59	0.37	2.77-4.21	3.19	0.37	2.31-3.92

Note: Mean ratings of age, attractiveness, prototypicality and trustworthiness for the faces used in the present study were extracted from the Face-Place Face Database (version 2.0.3)'s codebook (Ma et al., 2015). Prototypicality refers to how much the features of an individual resemble others of the same racial group on a *5*-point Likert scale (*1* = less typically white looking to *5* = very typically white looking).

M = mean

SD = standard deviation6

Procedure

All study procedures were completed anonymously online using Google Forms. After agreeing to the statements of voluntary participation and informed consent, participants were automatically assigned a random identification number and completed the Faith subsection of the General Trust Scale. Upon advancing the Google Form, the experiment automatically began. It consisted of two parts separated by an interlude. Since colors have associations that may be universal or culture specific (Tham et al., 2020), all participants rated the faces twice. In Part 1, the 80 red and 80 blue faces appeared in a randomized order and participants indicated how trustworthy they looked on a Likert scale from 1 ("very untrustworthy") to 7 ("very trustworthy"). Before beginning Part 2, participants were randomly filtered into one of the four Group Stereotype conditions: Negative Stereotypes about the Blue Group (NSBG), Negative Stereotypes about the Red Group (NSRG), Positive Stereotypes about the Blue Group (PSBG), or Positive Stereotypes about the Red Group (PSRG), and accordingly read a short statement portraying one of the color groups as either having a positive or negative reputation, as described above in Stimuli. In Part 2, participants rated the trustworthiness of the same 80 red and 80 blue faces for a second time, again presented in a fully randomized order.

Analysis

This experiment contained two control conditions. First, to control for color preferences, participants rated each face before reading stereotyped information about one color group. Second, stereotyped information was provided for only one color so that all other facial stimuli acted as a control.

The statistical analysis was carried out in Rstudio Version 1.3.1093 (RStudio Team, 2020). H1 was tested using a repeated-measures ANOVA (ezANOVA) to model the effects of Time Point (Baseline, After Stereotype Information) and Stimuli Color (Blue Faces, Red Faces) as within subjects factors, and Stereotype Condition (Positive Stereotype about the Blue Group, Positive Stereotype about the Red Group, Negative Stereotype about the Blue Group, Negative Stereotype about the Red Group) as a between-subjects factor.

A linear mixed effect model was conducted to test the effect of Stimuli Gender on Rated Trustworthiness (H2). The gender of the facial stimuli (Female, Male) was modeled as a within-subjects factor and Participant's Gender (Female, Male) was modeled as a between-subjects factor. A random intercept allowed for individual variability. Finally, a correlation test was conducted to test the effect of General Faith (H3) on Rated Trustworthiness. General Faith (the continuous measure as rated by the Faith subsection of the General Trust Scale), was thus compared to participants' individual mean trust ratings of faces at Baseline.

RESULTS

In the model related to H1, a three-way interaction effect between Stereotype Condition x Time Point x Stimuli Color was found to be significant, $F(3,117) = 11.26$, $p < 0.001$. To decompose these findings, Bonferroni corrected pairwise post hoc t-tests were conducted to investigate additional contrasts using an adjusted p-value of 0.001.

Post hoc paired-samples t-tests found systematic differences between Red Faces and Blue Faces at Baseline. When Red Faces (M = 3.94, SD = 0.82) were compared to Blue Faces (M = 3.79, SD = 0.82) at Baseline, the Red Faces were rated significantly higher on trustworthiness, $t(120) = -7.27$, $p < 0.001$. Post hoc paired-samples t-tests also indicated that participants rated the faces significantly differently after reading about the group stereotypes (see Table 3). Ratings remained stable for the two control conditions (i.e., blue faces that were rated by participants in the condition NSRG and for red faces that were rated by participants in the condition PSBG). The complete results are available in the supplementary materials.

Post hoc independent samples t-tests found differences between Red Faces and Blue Faces after Stereotype Information according to Group Stereotype Conditions. When Red Faces were compared to Blue Faces after Stereotype Information in the NSBG Group, Red Faces were rated significantly higher, $t(28) = -3.60$, $p = 0.001$. All other comparisons were non-significant after applying the adjusted p-value of 0.001 and are reported in the supplementary materials.

Table 3. Contrasts between trust ratings at baseline and after the experimental manipulation

Facial stimuli color / Group Stereotype Condition	Baseline		After Stereotype Information		T	df	Mean difference	SE difference	95% CI		p	Cohen's d
	M	SD	M	SD					Lower	Upper		
Blue Faces												
NSBG	3.88	0.81	3.12	0.92	3.63	28	0.76	0.21	0.333	1.18	< 0.001	0.86
PSBG	3.55[a]	0.90	4.03[aa]	1.22	-3.59	32	-0.47	0.13	-0.74	-0.20	< 0.001	-0.44
NSRG	3.88	0.70	3.90	0.91	-0.18	31	-0.02	0.12	-0.27	0.23	0.859	-0.03
PSRG	3.88	0.84	3.18	0.91	3.23	26	0.70	0.22	0.25	1.15	0.003	0.80
Red Faces												
NSBG	4.04	0.78	3.76	0.93	1.41	28	0.29	0.21	-0.13	0.70	0.170	0.33
PSBG	3.67	0.93	3.64	1.20	0.20	32	0.03	0.13	-0.23	0.29	0.846	0.02
NSRG	4.02	0.71	3.38	1.02	4.63	31	0.64	0.14	0.36	0.93	< 0.001	0.73
PSRG	4.05	0.81	3.69	0.93	1.70	26	0.36	0.21	-0.08	0.80	0.103	0.41

Note. NSBG = Negative Stereotypes about the Blue Group, PSBG = Positive Stereotypes about the Blue Group, NSRG = Negative Stereotypes about the Red Group, PSRG = Positive Stereotypes about the Red Group, M = Mean, SD = Standard Deviation, T = t-statistic, df = Degrees of Freedom, SE = Standard Error, CI = Confidence Interval, p = p-value.
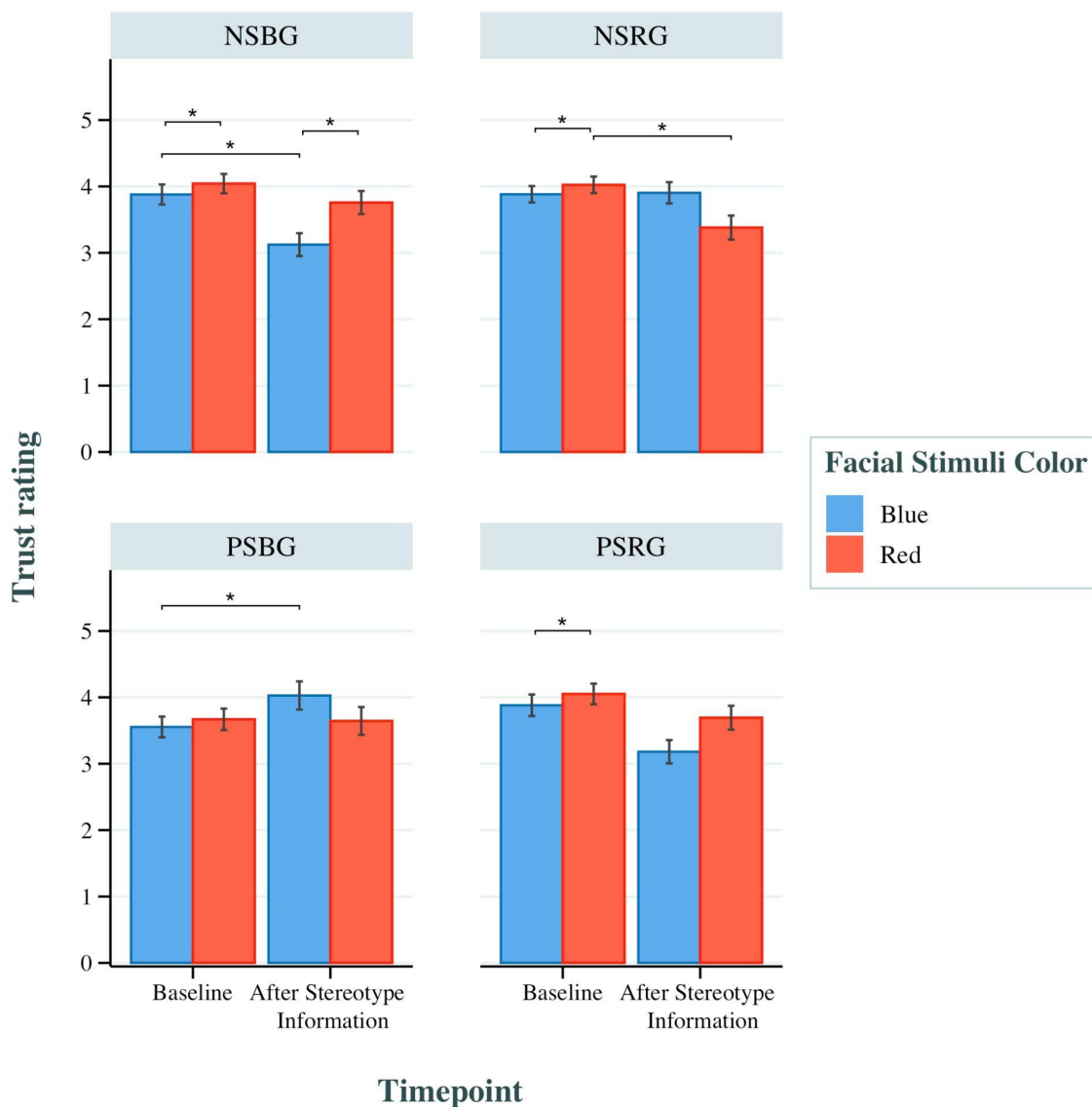
[a] 3.5541, [aa] 4.0238

Figure 2: H1 interaction of condition, information, and stimuli color. Significant differences emerged between Red Faces and Blue Faces after the introduction of Stereotype Information. Differences were more pronounced when the Stereotype Information was negative. Error bars show SE of the mean.

In relation to H2, a two-way ANOVA was conducted to test the effect of Stimuli Gender and Participant Gender on Rated Trustworthiness. A main effect of Stimuli Gender was found, $F(1, 119) = 27.83$, $p < 0.001$. Participants rated Female Faces (M = 3.88, SD = 0.74) higher than Male Faces (M = 3.58, SD = 0.82).

A one-way ANOVA revealed that participants across all four groups reported roughly the same General Faith level compared to each other, (M = 39.12, SD = 7.47), $F_{(3, 117)}$ = 0.64, p = 0.591. To test H3, we conducted a correlation test between General Faith and participants' individual mean trust ratings of faces at Baseline. The test showed no significant correlation, r(119) = 0.08, p = 0.357.

Exploratory analysis

Following the above-described results, we wanted to test whether participants' General Faith level correlated with their Pattern of Change between ratings at Baseline and ratings after Stereotype Information. We approached this question through an exploratory correlation analysis. The changes in Rated Trustworthiness concerned ratings of only the Stimuli Color that participants received information about and were calculated as the absolute value of the difference between participants' mean ratings at Baseline and After Stereotype Information. However, the exploratory correlation between General Faith level and Pattern of Change was nonsignificant, r(119) = 0.16, p = 0.087.

Additionally, we conducted an exploratory analysis that examined correlations between Principal Components Analysis (PCA) using participants' General Faith Factor Scores and Pattern of Change. The Pattern of Change was calculated as in the above-described correlation test, with the exemption of using absolute values. This test was performed individually for each condition. In the condition Positive Stereotypes about the Red Group, we found a negative correlation between Factor 1 and Pattern of Change, r(24) = -0.43, p = 0.027. Other factors and conditions showed marginal results (see supplementary material).

DISCUSSION

Summary of Results

Both an individual's gender and the introduction of new information about a group stereotype changed perceived trustworthiness. However, results were inconclusive regarding a relationship between participants' overall faith in others and perceived trustworthiness. In other words, results from the present study effectively support H1 and H2 but not H3.

H1 proposed that being exposed to positive or negative stereotype information about a previously unknown group would change how participants rated the trustworthiness of the group members in accordance with the sentiment of the information. This hypothesis was partially supported by our results. Participants who received information about blue faces changed their reported trustworthiness of the blue group members. More positive ratings

followed positive stereotypic information and more negative ratings emerged after negative stereotypic information. Negative stereotypic information about red faces elicited a decrease in evaluated trustworthiness. However, positive stereotypic information about red faces did not result in an increase in trustworthiness. Participants did not find the red faces more trustworthy when given positive information, unlike the results observed for blue faces. Considering that red faces were rated as more trustworthy at Baseline as compared to blue faces, prior associations that participants have about the colors red and blue may interact with the stereotypic information.

H2 tested whether the evaluation of a person's trustworthiness was influenced by the gender of the person being evaluated (the trustee). Results supported this hypothesis. Both male and female participants systematically perceived female faces as more trustworthy. This finding is in line with a body of literature demonstrating that females are assumed to be more trustworthy than men (for relevant reviews see Chaudhuri et al., 2013; Schniter & Shields, 2020; Sent & van Staveren, 2019).

Finally, H3 investigated the effect of a person's level of general faith on their first impression of others' trustworthiness. However, the results yielded no significant correlation. Exploratory findings from the factor score correlations suggest that there are underlying patterns in participants' general faith and their response to others. However, these patterns appear to be complex and not captured by the measures used in our study.

Taken together, stereotypes about facial skin color and stereotypes about a persons' gender significantly influence perceived trustworthiness of individuals. The introduction of stereotypic information that is based on skin color substantially changes subsequent judgments about the same person, especially if the stereotype is negative. There is limited evidence that faith in others in general contributes to judgements about the trustworthiness of individuals.

Stereotypes

Findings from this study demonstrate that skin color-based stereotypes may be heavily relied on when a person has no information about an individual other than physical appearance. Having a stereotype about certain out-groups can result in racism and lack of cooperation which can be detrimental for companies working with individuals with different ethnicities. However, our results also clarify that individuals can change their initial stereotype about the trustees. When receiving positive stereotype information about the blue group, individuals in the PSBG condition changed their initial trustworthiness rating about that group to become significantly higher. Similarly, when receiving negative stereotype information about either the blue or red group, the individuals in the conditions NSBG and NSRG changed their initial opinion

about the individuals of that color in the concrete condition. I.e., in the NSBG condition, blue individuals were perceived as less trustworthy and in the NSRG condition, red individuals were deemed less trustworthy than they initially were rated. Thus, individuals in three out of four conditions changed their initial stereotype about the trustees when receiving either positive or negative stereotype information. This shows that context and knowing information about an out-group member has great influence on how trustworthy they are perceived. The results also show that it is easier to change a stereotype more negatively with negative information than changing it more positively with positive information. This is clear, as only the participants in the condition PSBG changed their thoughts on the blue faces; this was not the case for the PSRG condition. Red individuals in the latter group were not perceived as more trustworthy after being provided with positive information about them. When not having contextual information about an out-group member, we rely on physical appearance and the stereotypes connected with that appearance.

Gender

Additionally, much existing literature reports that gender stereotypes influence perceived trustworthiness. The present study supports existing studies by showing that female faces were perceived as more trustworthy than male faces regardless of the participant's gender. However, unlike some existing literature, there was no difference between the ratings by female and male participants (e.g., Shockley-Zalabak et al., 2019). In other words, when a participant was faced with a man or a woman belonging to the same out-group, they relied on the gender of that individual to make a trustworthiness decision. These results suggest that there may be fewer barriers for women when interacting with out-group members or more opportunities for women to overcome negative stereotypes that are based on skin color. This study did not consider how negative stereotypes about women may be restrictive. These findings, of course, must be interpreted within the context of outgroup trustworthiness, and may not be generalizable to other contexts.

Faith

Although general faith in other people prima facie may mitigate stereotypic information, the present study was not able to uncover such a relationship. However, the exploratory analyses identified a correlation between General Faith and Pattern of Change in the underlying data structure, which future studies need to further investigate. In this study, individuals do rely more on skin color than their own level of general faith to make a trustworthiness judgment. These findings, while inconclusive, suggest that being a trusting individual in general does not affect how much we trust others. Stereotypes may be more deeply embedded in us as humans and, even though a trustor wants to trust an individual, their stereotype about that specific out-group prevents

people   from having faith in their fellow human beings regardless of physical appearance.

Change

We tested if an individual's level of general faith was important in other domains than proposed by H3. While not significant, two exploratory analyses showed at a trend level that there was a positive correlation between General level of Trust and Pattern of Change. This indicates that people are perhaps likely to be more open to changing their initial stereotype the more trusting they are in general. If this is the case, individuals are mostly affected by the trustees' physical appearance but with contextual information about the trustee, trusting individuals may change their initial opinion about the trustee more than individuals with a low general faith.

The second exploratory analysis found a significant negative correlation in the condition Positive Stereotypes about the Red Group between factor 1 and Pattern of Change. This means that in the PSRG condition, the more participants follow a specific pattern the less they change their initial opinion about the trustee. Thus, the more individuals conform to the same stereotype the less they change their opinion even though they are provided with positive traits about that individual. Recall that this condition was the only non-significant condition in relation to H1. Participants in the three other conditions did significantly change their opinion about the trustees according to the information they received. Thus, in order to change an opinion about an out-group member, individuals are affected by their level of general faith in people and how strong their stereotype towards that out-group is.

Implications for Cultural Psychiatry and Global Mental Health

The introduction of positive stereotypes positively changed the perceptions of some participants. This information may be useful when developing local agendas for reducing negative stereotypes. For example, one possible solution may be to publicize positive traits that people within a group have in order to replace negative stereotypes with new, positive information about individual group   members. We are cautious not to recommend countering negative stereotypes with positive stereotype, as any groupwide claim may have a negative impact on mental health, and positive stereotypes can still do harm (Gupta, Szymanski, D. M., & Leong, 2011). However, taking an inclusive and person-by-person approach to representing the goodness in humans (e.g., representing individual stories from many skin colors and gender identities) may provide useful information about individuals that helps counter negative beliefs about groups. Prior to implementation, this possible solution, first, must be studied directly to ensure that it does not cause accidental harm.

Limitations

This study possesses some limitations. The most significant limitation is the way in which general trust is measured. For this study, only the Faith subsection of the General Trust Scale related was used. This resulted in only seven questions used to measure an individual's level of general trust. The results from H3 might have looked differently if participants went through a more in-depth trust questionnaire or a trust study before completing this study. As mentioned in the methods section, this study was voluntary and without payment, therefore the length of the experiment could also be problematic for some. Rating 320 pictures in total was a time-consuming task. The fact that seven participants chose to pick the same number throughout, supports this as a potential confounding factor. Had there been fewer pictures to rate, perhaps more would have taken part in the experiment. However, the decision to include all 80 pictures as both blue and red was determined to be necessary to get a solid dataset. Moreover, the experiment was conducted online, and thus took place in an uncontrolled environment. If the experiment was conducted in a laboratory setting, participants would not be distracted by the outside world. Lastly, participants had diverse linguistic backgrounds and English proficiency was collected by self-report, which is a potential confounding factor because the experiment was conducted in English. Future studies should assess language comprehension for similarity of meaning across the study sample.

Furthermore, the contributions of local culture were not assessed, and should be.

Future directions

Two interesting findings regarding color warrants further investigation. Firstly, the fact that red faces were rated as more trustworthy at Baseline as compared to blue faces suggests that culture may play a role in color associations. Secondly, we have suggested possible explanations for the results showing a different pattern in the PSRG condition as compared to the three other conditions (i.e., an unexpected lower, but non-significant rating of both red and blue faces after positive stereotype information). This finding however opens new avenues of inquiry into the role of color and cultural perceptions on trust behavior. Regarding gender, this study supports earlier findings that women are generally perceived as more trustworthy than men. Future studies may seek to uncover whether this can be affected by context, i.e., if there are circumstances under which men are indeed perceived as more trustworthy than women. Finally, given the limitations surrounding the measurement of general trust coupled with trend-level results for the exploratory correlation analysis between General Trust and Pattern of Change, we suggest that the role of general trust in relation to first impressions of trust should be further examined.

CONCLUSION

For first impressions, trustors rely on their own stereotype to judge if an individual can be trusted. These stereotypes are deeply rooted in our mind and memory but are changeable if we are met with new information about the out-group. This study shows that skin color and gender are key elements used to judge trustworthiness when no information about an individual is provided. In addition, the trustor's own level of general faith and how robust the stereotype is, may be involved in changing the specific stereotype an individual possesses.

DATA AND MATERIALS

All data and materials for this article are available at osf.io/z3j8d.

AUTHORSHIP

NCBW designed the experiment, created the stimuli, collected the data, wrote some of the code, analyzed the data, and wrote the manuscript. This article is based on her thesis.

ANF wrote some of the code, reanalyzed some of the data, and wrote major sections of the manuscript. Her work was substantial enough to warrant authorship.

DC conceptualized the project, supervised the work, and wrote sections of the manuscript.

DATA AND MATERIALS AVAILABILITY

All data and materials for this article are available in the Open Science Framework (OSF) repository at osf.io/z3j8d.

STATEMENTS AND DECLARATIONS

The authors have no competing interests to declare that are relevant to the content of this article.

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ETHICS APPROVAL

This study was conducted in compliance with the Declaration of Helsinki and approved by the Central Denmark Region Committees on Health Research Ethics. The experiment was performed under all relevant guidelines and regulations.

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Supplementary Materials

Stereotype information presented to the participants

1. Positive stereotype information about the blue or red group

As you probably noticed, the faces were either blue or red. The reason for this is that the individuals belong to two different groups. I will now provide you with some personality traits which are characteristics for all the members of the group consisting of the BLUE/RED individuals.

All these individuals have in common that they value honesty, morality, and loyalty. People around them, both in their personal and professional lives, describe them as kind, caring, empathic, helpful, consistent, and ethical. All in all, their friends and family see them as highly likeable and reliable.

Now that you have been given some information about one of the groups, I will now ask you to rate all the individuals' trustworthiness again.

2. Negative stereotype information about the blue or red group

As you probably noticed, the faces were either blue or red. The reason for this is that the individuals belong to two different groups. I will now provide you with some personality traits which are characteristics for all the members of the group consisting of the BLUE/RED individuals.

All these individuals have in common that they have been described by former employees as disloyal and dishonest. They have all been fired from more than two jobs over the past year for being unreliable, inconsistent, and impolite. More than one family member has distanced themselves from the individual due to immoral behavior among others.

Now that you have been given some information about one of the groups, I will now ask you to rate all the individuals' trustworthiness again.