Perceived wealth matters for stereotypes about trustworthiness, a cross-cultural analysis

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Abstract

People make many inferences based on cues of wealth. These inferences regarding the character and behavior of others have real-life consequences, for example, social distancing from individuals at the lower end of the socio-economic spectrum. In this cross-cultural study, we investigate the association between perceived wealth and perceived trustworthiness. In studies 1 and 2, we first investigated people's ability to detect wealth from pictures of households in a diverse sample of participants (France, United Kingdom, India, and the Democratic Republic of Congo, N = 572). We found that people are very good at detecting wealth, both in pictures of households taken in their own country and pictures from foreign households. This suggests that there are universal characteristics that allow individuals to accurately estimate the wealth of households across cultures. In study 3, we measured people's stereotypes about trustworthiness based on implicit information about wealth in a culturally diverse sample of participants (United Kingdom and Democratic Republic of Congo, N = 348). Perceived trustworthiness consisted of three measures: cooperative character (e.g. reliable), cooperative behavior (e.g. cheating their partner if they had a chance), and self-control (e.g. ability to resist temptations). We found that participants perceived inhabitants of wealthier households to be more trustworthy than inhabitants of poorer households, regardless of the country of origin of the participant. Our results imply that wealthier societies are likely to have higher levels of interpersonal trust.

Introduction

Imagine you are invited into someone's home for the first time. You enter the house and you see the kitchen and living room. The rooms are large and filled with objects such as a large fridge and a television. What inferences do you make about the person who invited you to their home? Is this person trustworthy? Are they likely to return a significant amount of money lent to them? Are they self-disciplined?

People hold many stereotypes based on the attributes of others. For example, people tend to perceive young males as more competitive than females, and as being differentially oriented towards short- and long-term mating (females being seen as more oriented towards long-term mating) (Sng et al., 2020). People tend to see older individuals as less competent than younger individuals (Lamont et al., 2015). People perceived individuals living in "desperate ecologies" as more likely to be sexually unrestricted and impulsive, and individuals living in "hopeful ecologies" as having more self-control, and investing more in theireducation and the education of their children (Williams et al., 2016). These studies show that people make many inferences based on limited information about a person. Studies show that people use cues such as facial expressions (Bjornsdottir & Rule, 2017), accents (Kinzler & DeJesus, 2013), material possessions (Desmichel & Rucker, 2022; Dittmar, 1994), body mass index (Hebl & Mannix, 2003), music preferences (Rentfrow & Gosling, 2006), shoes (Gillath et al., 2012), selfies (Qiu et al., 2015), and tweets (Qiu et al., 2012) to make inferences about the personality traits and behavior of others.

Among these, some evidence suggests that people hold stereotypes related to social class or the wealth of others. For example, poorer individuals are perceived as warmer but less competent than richer individuals (Durante et al., 2017; Oldmeadow & Fiske, 2007), and competence stereotypes emerge already in young children, with 4th, 6th, and 8th graders reporting that the rich are more competent at school than the poor (Woods et al., 2005). Although richer individuals can sometimes be perceived as having "bad morality" (Tao et al., 2016), many studies have found that implicit attitudes about the rich tend to be positive (Horwitz & Dovidio, 2017), even in cultural contexts as different as the United States and China (Wu et al., 2018).

Wealth stereotypes do not necessarily reflect reality. Rather, they are psychological mechanisms designed to recognize and navigate specific social opportunities and threats presented by others. These stereotypes function as inputs to determine the most appropriate behavior to adopt when interacting with others. For instance, wealth stereotypes lead children to anticipate the sharing behavior of others (Ahl et al., 2019) or to a more lenient response towards wealthy individuals who cause car accidents (Horwitz & Dovidio, 2017). Stereotypes about wealth also have an impact on political decisions, as individuals holding negative stereotypes about the wealthy are more likely to endorse major redistributive policies, even when accounting for party membership, ideology, and income (Sadin, 2014). Stereotypes about wealth are also often invoked as a factor that contributes to the maintenance of economic inequality. Given that stereotypes about poverty engender social distancing, individuals with limited resources are often precluded from accessing additional resources (Piff et al., 2018). This evidence suggests that stereotypes concerning wealth may play a role in shaping the selection of cooperative partners, such that wealthier individuals are favored over poorer individuals.

The present study aims to examine the association between perceived wealth and perceived trustworthiness. Given that people may hold divergent attitudes towards wealth-based stereotypes when asked explicitly and implicitly, we developed an experimental protocol to elicit *implicit* stereotypes about wealth. Various cues are used to assess people's social class or wealth, including their facial expression (Bjornsdottir & Rule, 2017), clothing (Gillath et al., 2012), food preferences (Monsivais & Drewnowski, 2009), and living room decor (Davis, 1956). In this project, we used pictures of people's living rooms and kitchens to convey information about their wealth. Two preliminary studies (studies 1 and 2) were conducted to validate participants' ability to accurately infer wealth-related information from these pictures. Subsequently, in study 3, participants from the UK and the Democratic Republic of Congo imagined an individual living in the depicted household and rated their trustworthiness. We investigated the presence of wealth-related stereotypes and their consistency across the two study populations. Our investigation focused on trustworthiness stereotypes since interpersonal trust is an essential determinant of societal outcomes, including economic development as measured by GDP, which positively correlates with interpersonal trust (Ortiz-Ospina & Roser, 2016). Economists argue that higher levels of trust lead to more economic growth (Arrow, 1972), a hypothesis that has been validated in several studies (Algan & Cahuc, 2010; Guiso et al., 2006). Our study allows us to explore another (non-exclusive) explanation for the correlation between GDP and interpersonal trust: people perceive wealthy individuals to be more trustworthy.

Study 1

Overview
In this study, we wanted to test people's ability to rank pictures of households based on wealth. If participants can rank these pictures, it demonstrates their ability to accurately detect wealth cues. We were also interested in participants' ability to rank pictures of households from foreign countries. This would show that the ability to detect wealth cues is independent of cultural similarity. To test this, we recruited participants from countries with different cultures (India and France) and asked them to rank pictures of households from several countries (India, France, and Colombia) according to the wealth of the household depicted. We relied on the Dollar Street Database to collect pictures of households from a diverse set of countries around the world and from different wealth levels (https://www.gapminder.org/dollar-street). This database was invented by Anna Rosling Rönnlund at Gapminder to show how people's lives around the world may be more similar than we imagine. For each household in the database, we have information about the total monthly consumption of the household in $, adjusted for purchasing power parity ($PPP). For simplicity, we will refer to the household's monthly consumption in $PPP as the household's wealth.

Methods
Pre-registration. The design and predictions for this study were pre-registered prior to data collection. The pre-registration is available at https://osf.io/7xbgf.

Participants. Our pre-registered sample size was determined by a priori power analysis using G*Power 3 and a pilot study. To compute the necessary number of participants, we decided that the minimal effect size of interest would correspond to a beta coefficient of 0.2 for standardized variables with a power of 90% and a two-sided t-test. Using this value in the power analysis, we calculated that we needed 255 participants. We recruited a total of 382 participants from India (206) and France (176) using MTurk and Crowdpanel

respectively. We recruited a larger sample than needed because of data quality concerns when recruiting participants with MTurk (Chmielewski & Kucker, 2020). We excluded a total of 56 participants (40 from India and 16 from France) who failed one or more of four attention checks designed according to best practices in the literature (a Captcha score of less than 0.5, a response time lower than 10 sec per question, an open-ended question on the strategy used to answer question, and a more traditional screening question on the number of cars seen in a picture) (Boas et al., 2020). Our final sample size was 336 participants, 176 from India (100 males, 57 females, 19 unknown, mean age = 38.11, sd age = 7.8) and 158 from France (73 males, 85 females, mean age = 46.02, sd age = 12.98).

Experimental setup. Participants were recruited online to complete a study called "a house ranking game". Participants were shown 6 groups of five randomly selected pictures of households (living rooms) from a given country: two groups from France, two groups from India, and two groups from Colombia. We selected these countries such that participants would each rank pictures of households from their own country, and from a foreign country. We added Colombia to the set of countries because it was not familiar to either the Indian and French participants. Participants were asked to rank the pictures of the household from the poorest to the richest for each group of five pictures. Participants were then asked to select from a list of 6 countries (China, Colombia, France, India, Nigeria, Serbia) the country of origin of each group of five pictures. Finally, participants were asked to explain what information they used to rank the pictures.

Materials. Pictures of households were downloaded from the Dollar Street database (https://www.gapminder.org/dollar-street). We restricted our sample to three countries (Colombia, India, and France). We used pictures of living rooms as they are very rich stimuli as opposed to pictures of single items such as toothbrushes or front doors. We excluded from our sample pictures in which inhabitants were visible.

Figure 1: Example of pictures of living rooms used in our study. (a) a picture of a living room from an Indian household, with a monthly consumption of $65 (PPP). (b) a picture of a living room from a French household, with a monthly consumption of $1,036 (PPP).

Predictions
We made the following predictions in our pre-registration :
P1: Participants are better than random at ranking households based on income.
P2: People are better at ranking households from their own country than foreigners are.

Analysis. We computed the correlation between the actual wealth ranking of the pictures and the ranking given by the participant for each of the six groups of pictures (ranking score). We recorded whether participants were able to identify the country of origin of each of the 6 groups of pictures. We also explored the answers given by participants about the information they used to rank the images of households.

Results

We first found that participants were good at ranking pictures of households according to their wealth. The average ranking score across participants and groups of images was 0.50 (sd = 0.38). We ran a one-sample t-test and found that the correlation was significantly superior to zero (p < 0.001, t = 58.39)), the score participants would have obtained if they ranked pictures randomly. We then tested whether there is a home country advantage in ranking pictures, for example, whether French participants were better at ranking French pictures than Indian participants. To do this, we ran a regression of the ranking score and included a dummy indicating whether the stimuli were from the participant's own country. There was no home country advantage for ranking pictures of households (β = 0.02, SE = 0.02, p = 0.26). We were also interested in testing whether French or Indian participants were better at ranking households overall and whether French, Colombian or Indian households were easier to rank. We regressed the score of participants on their country of origin, the country of the pictures, and the interaction between these terms. We found that Indian participants were overall better than French participants at ranking images, that pictures of Indian households were easier to rank, and that Indian participants were comparatively worse than French participants at ranking Indian pictures, see Figure 2. We also asked participants to identify the country of origin of each group of five pictures. There were 6 possible responses, so participants had a 0.17 chance of finding the right answer randomly. Again, we compared the participants' ability to identify the country of origin of pictures from their own country to pictures from other countries. We found that participants were better at identifying the country of origin of the picture when it came from their own country (β = 1.255, SE = 0.063, p <0.001), see Figure 3.
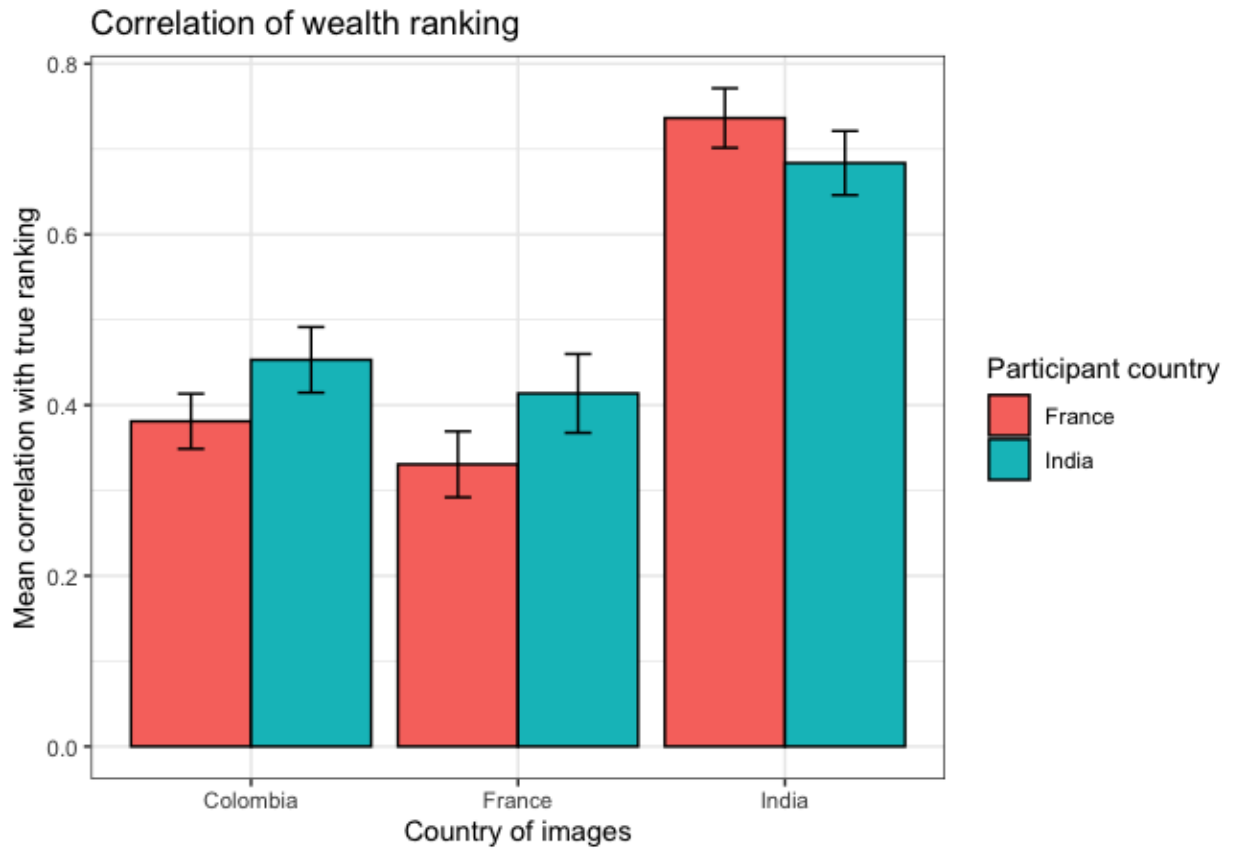
Figure 2: Mean correlation between participant's ranking of wealth and true ranking of wealth of pictures of households, by country of images (Colombia, France, and India) and country of participant (France and India). Error bars represent the 95% confidence interval.
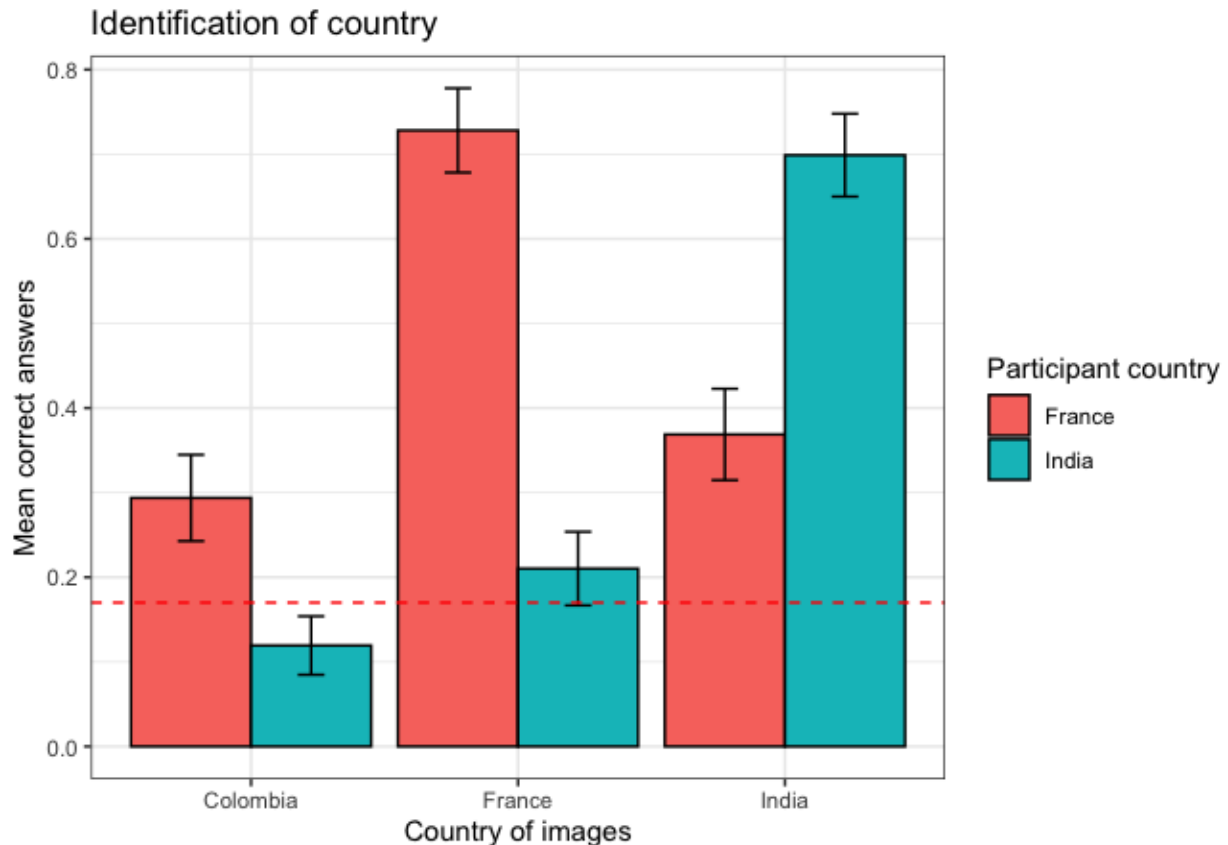
Figure 3: Mean number of correct answers to the country identification of the groups of pictures, by country of images (Colombia, France, and India) and country of participant (France and India). We can see that participants are better at identifying the country of origin of pictures from their own country than pictures from foreign countries. Error bars represent the 95% confidence interval.

Discussion

The results of study 1 suggest that pictures of households are effective stimuli for participants to make inferences about wealth. Our findings show that individuals are not only capable of accurately ranking the wealth of households in their own country, but also in foreign countries, indicating that there may be some universal characteristics that allow individuals to accurately estimate the wealth of households across cultures. Nonetheless, our study revealed that participants were better at identifying the country of origin of pictures from their own country, indicating that some cues about the country of origin may be more readily apparent when it is one's own country. In summary, these results provide support for the idea that pictures of households can serve as a means of conveying information about wealth, regardless of the country of origin of the picture.

Study 2

Overview

The aim of study 2 was to compare people's ability to match pictures of households based on their wealth to their ability to match pictures based on their country of origin. In this way, we have a benchmark to which we can compare people's ability to match pictures of households based on their wealth. Participants were presented with three pictures of households: one main picture and two additional pictures and were asked to identify which of the additional pictures matched the main picture, in one condition in terms of wealth, and in the other condition, country of origin. Our prediction was that participants would perform better when matching based on wealth, as differences in wealth, are more salient and easier to discern than differences in the country.

Methods

Pre-registration. The design and predictions for this study were pre-registered prior to data collection. The pre-registration is available at https://osf.io/sw3a5.

Participants. In order to estimate the required sample size, we ran a pilot on 10 participants. We tested whether participants were better at matching pictures in the income condition than in the country condition and found an odds ratio of $\beta = 1.41$, SE = 0.28, p < 0.0001. We wanted to know what effect size we could detect with a sample of 100 participants. To do so, we used the simr package in R. We increased the sample size to 100 participants, and set the smallest effect size of interest to $\log(1.5) = 0.18$. We simulated the power for different values of the sample size. A sample size of 100 was large enough to detect such an effect with virtually 100% power, and the observed effect size in the pilot data was larger than this, we decided to run the study on 100 participants from each country.

Because of concerns with data quality, we recruited 237 participants from the Democratic Republic of Congo ("DRC") to allow for a large attrition rate. We also recruited 102 participants from the United Kingdom ("UK"). Participants in DRC were recruited through a local non-profit organization in the city of Goma. Participants in the UK were recruited online via Prolific. We excluded from our sample 93 participants (90 from Congo and 3 from the UK) who failed one or more of the attention checks. For DRC participants, the attention checks were total response time lower than 6 minutes, an open-ended question on the strategy used to answer questions, and a more traditional screening question on the number of cars seen in a picture. For UK participants, the attention check was a single question designed to measure attention. Our final sample size was 246 participants.

Experimental setup. Participants were presented with a set of three pictures from the same category (living rooms or kitchens). For each set, they had to match the main picture to one of the two other pictures based either on wealth or on country. Participants had to rank 14 pictures based on country, and 14 pictures based on wealth. We randomized the order of these tasks such that half the participants started with country and the other half started with wealth.

Materials. Pictures of households were downloaded from the Dollar Street database (https://www.gapminder.org/dollar-street). We restricted our sample of pictures to 6 countries (China, Colombia, India, France, Nigeria, and Serbia) and to two types of pictures (living rooms and kitchens). We selected these countries as there were many households sampled from them with a high level of income variance, and these 6 countries came from different regions of the world. We selected these two types of pictures and they contained a lot of information as opposed to pictures of single items such as toothbrushes

or front doors. We excluded from our sample pictures in which household members were visible. To create pairs of pictures based on wealth, we first randomly selected a picture from our sample, then calculated a wealth interval of plus or minus 20% of the household's wealth, and then randomly selected a picture from within that interval. A third picture was then randomly selected among all the pictures that didn't fall within this plus or minus 20% interval. To create pairs of pictures based on country, we first randomly selected a picture from our sample, then randomly selected another picture from the same country. A third picture was then randomly selected among all the pictures from different countries.

Analysis. We computed the average score of participants (% of questions answered correctly out of the 14 trials) when matching pictures based on country and based on wealth. We compared the score of participants in these two conditions. We also tested whether there was an effect of the type of stimuli (kitchens or living rooms).

Results

Participants performed no better than chance level when matching pictures based on country (mean = 0.51, sd = 0.11), but were able to perform better than chance when matching based on wealth (mean = 0.75, sd = 0.12). We ran a probit model of the probability of finding the correct answer based on the condition (matching on wealth or country) and on the type of stimuli (living room or kitchen). We find that the probability of finding the correct answer was higher in the wealth condition (odds ratio of 2.86, 95% confidence interval = [2.57, 3.18], z-stat = 19.38, $p < 0.001$) and higher in the living room condition (odds ratio of 0.71, 95% confidence interval = [0.64, 0.79], z-stat = -6.34, $p < 0.001$). Overall, then, participants were better at detecting wealth from pictures of households than detecting the country of origin. These results, in combination with the findings from Study 1, provide robust evidence that household pictures are rich sources of cues related to wealth perception.
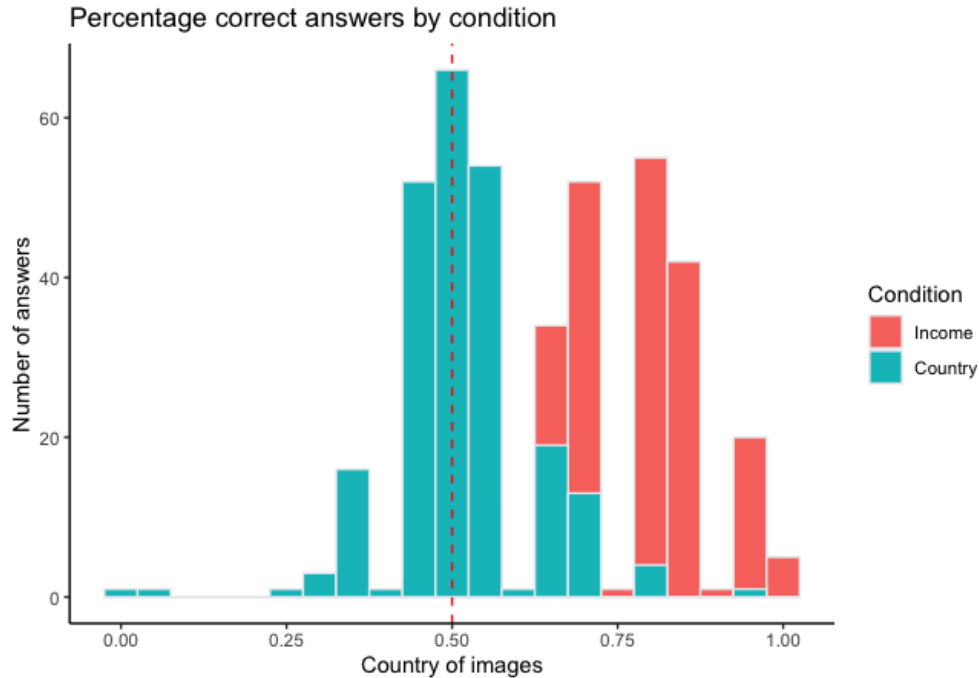
Figure 4: Distribution of percentage of correct answers given by condition for each participant. The vertical dotted line reflects chance.

Study 3

Overview

Our aim was to investigate the potential existence of wealth-based stereotypes about trustworthiness. In study 3, to elicit implicit stereotypes, we presented participants with a single picture of a household and asked them to imagine an individual living in the household, and then rate that individual on a number of characteristics. We used the picture to subtly convey information about the household's wealth. We chose to conduct a between-participants study design rather than within-participants to avoid making the independent variable transparent and causing demand characteristics. Indeed, studies have shown that people do not express the same stereotypes when asked explicitly or implicitly (Horwitz & Dovidio, 2017). We were interested in people's implicit stereotypes about wealth.

Methods

Pre-registration. Design and predictions for this study were pre-registered prior to data collection. The pre-registration is available at https://osf.io/5aw8z/.

Participants. We performed an a priori power analysis with G*Power3. To compute the necessary number of participants, we decided that the minimal effect size of interest would correspond to a beta coefficient of 0.2 for standardized variables with a power of 90% and a two-sided t-test, meaning that one standard deviation increase in income would lead to a 0.2 standard deviation increase in the score of a cooperation trait. Using

this value in the power analysis, we saw that we need 255 participants in total. We first recruited 255 participants in the United Kingdom ("UK") via Prolific. We then wanted to replicate our results in a sample in Congo and recuited 237 participants from the Democratic Republic of Congo ("DRC") Participants in DRC were recruited through a local non-profit organization in the city of Goma. Participants were the same for study 3 and 2. They first completed study 3, then completed study 2 to avoid making the independent variable transparent. These participants were different from the participants for study 2. We excluded from our sample 144 participants (90 participants from DRC and 54 participants from the UK) who had not completed the experiment or failed one or more of the attention checks. For DRC participants, the attention checks were total response time lower than 6 minutes, an open-ended question on the strategy used to answer questions, and a more traditional screening question on the number of cars seen in a picture. For UK participants, we excluded participants who completed the study in less than 90 seconds (the shorter time was because UK participants only answered a subset of questions compared to DRC participants). Our final sample size was 201 participants for the UK and 147 for DRC.

Experimental setup. Participants were each shown one picture of a household (picture of living rooms) from a sample of households from different countries and with different levels of wealth. Participants were then asked to imagine an individual living in this household and to rate them on three of traits: cooperative character (5 items: trustworthy, reliable, responsible, honest, and loyal), cooperative behavior (4 items: likely to return a significant amount of money lent to them, likely to cheat their partner if they had a chance, likely to refuse to help a friend if they had better to do, likely to slack off and let coworkers do their part of the work) and self-control (6 items: able to resist temptations, self-disciplined, impulsive, likely to lose control often, able to stop themselves from doing thing they know is wrong, able to work themselves effectively towards long-term goals).

Materials. We downloaded pictures of different households from the Dollar Street database (https://www.gapminder.org/dollar-street). We restricted our sample of pictures to 6 countries (China, Colombia, India, France, Nigeria, and Serbia). We selected these countries as there were many households sampled from them with a high level of income variance, and these 6 countries came from different regions of the world. We selected pictures of living rooms as they are very rich stimuli as opposed to pictures of single items such as toothbrushes or front doors. We excluded from our sample pictures in which household members were visible. Each participant was shown one picture of a household randomly selected from our sample.

Analysis. For each of the 30 pictures of households, we computed the average perceived cooperative character, cooperative behavior and self-control across participants. We also computed Cronbach's alpha for each of these measures. We then regressed perceived cooperativeness on the log of the household's actual wealth.

Results

We first assessed the reliability of our different scales. The cooperative character scale had a high degree of reliability as measured by Cronbach's alpha (alpha = 0.90). Cooperative behavior was less reliable (alpha = 0.52). This was mainly due to one question ("How likely is this individual to return a significant amount of money lent to them?"). By dropping, we obtained a higher Cronbach's alpha of 0.70. Self-control had a satisfactory reliability (alpha = 0.66).

For each of the 30 pictures, we calculated the average perceived cooperative character, perceived cooperative behavior and perceived self-control score across participants. We then regressed these scores on the log of the actual wealth of the household depicted. As predicted, we found that inhabitants of wealthier households were perceived as having more cooperative character (β = 0.283, SE = 0.06, p<0.01; figure 5), more cooperative behaviors (β = 0.082, SE = 0.04, p<0.05; figure 6) and more self-control (β = 0.166, SE = 0.04, p<0.01; figure 7) than inhabitants of poorer households.
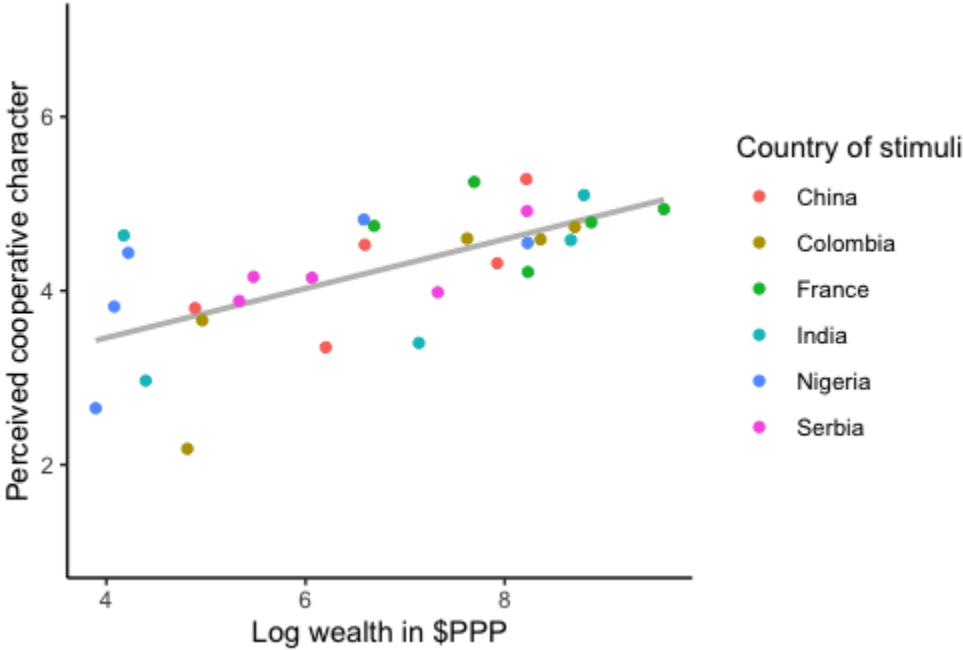

Figure 5: Regression of perceived cooperative character of the inhabitant on the log of wealth in $PPP of the household.
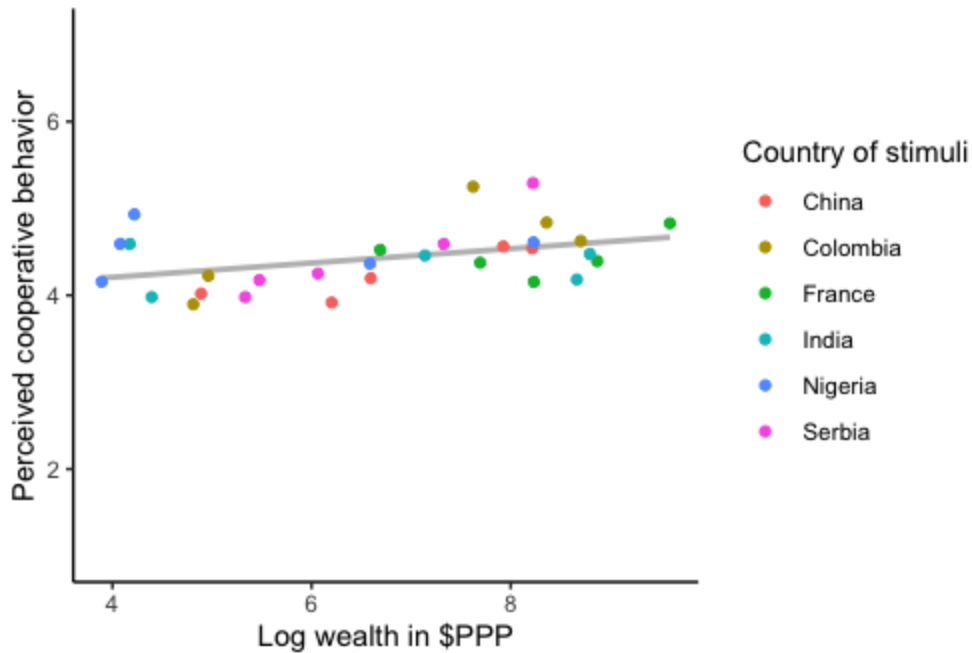
Figure 6: Regression of perceived cooperative behavior of the inhabitant on the log of wealth in $PPP of the household.
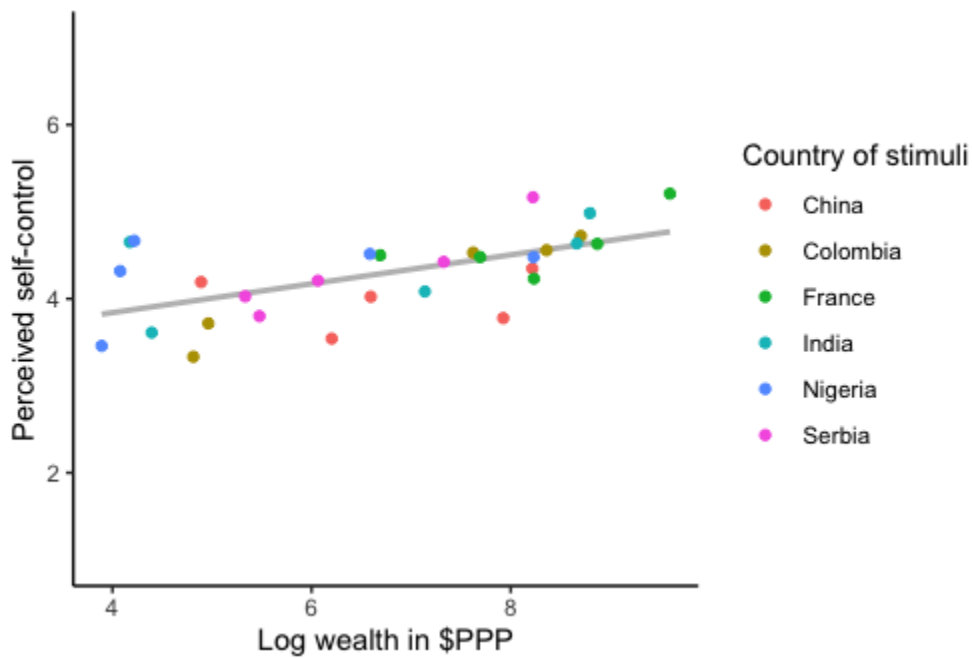

Figure 7: Regression of perceived self-control of the inhabitant on the log of wealth in $PPP of the household.

Discussion

We find that participants in both the UK and in the DRC rate inhabitants of richer households as having a more cooperative character, more cooperative behavior and more self-control. Participants from these two countries differed vastly in terms of their own wealth, with participants in the UK having access to more resources than participants in the

DRC. This study shows that wealth stereotypes about trustworthiness are independent from the participant's own wealth and the participant's culture.

Discussion and conclusion

The results of these studies suggest that people are extremely good at inferring wealth from pictures of households, even for foreign households. This implies that there may be some universal characteristics that allow individuals to accurately estimate the wealth of households across different cultures. Furthermore, by using pictures to convey implicit information about wealth, we found that people hold stereotypes linked to trustworthiness that are consistent across cultures, specifically in the UK and DRC.

Although these studies provide valuable insights, several questions remain unanswered. Firstly, we do not know what is the belief underlying these stereotypes. Do people believe that wealthy individuals are more trustworthy because they think that having more resources shapes personality and behavior, or do they believe that more trustworthy people are likely to earn more money? Further experiments could attempt to distinguish between these two hypotheses.

Another avenue for furture research is whether other information easily override wealth-based stereotypes related to trustworthiness? It is plausible that people use wealth cues to infer trustworthiness only when other cues such as physical traits or social relationships are not present. A follow-up study could investigate which information can compete with wealth cues to generate trustworthiness stereotypes. Another unanswered question pertains to the beliefs behind these stereotypes.

Regardless of the beliefs underlying people's stereotypes, these studies suggest that high levels of interpersonal trust in developed countries may result from economic development, rather than the direction of causality running only in the direction of interpersonal trust leading to economic development.

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