

EMPIRICAL ARTICLE

Westerners underestimate global inequality

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Abstract

Most global inequality is between countries, but inequality perceptions have mostly been investigated within the country. Six studies (total $N = 2656$, 5 preregistered, 1 incentivized for accuracy, 1 with a sample representative of the USA) show that Westerners (U.S. American, British, and French participants) believe that developing and middle-income countries' GDP per capita is much closer to developed countries' than it actually is, and that people in developing and middle-income countries have higher rates of car ownership, larger houses, and eat out more frequently than they actually do, meaning that Westerners underestimate global inequality. This misperception is underpinned by a convergence illusion: the belief that over time, poorer countries have closed the economic gap with richer countries to a larger extent than they have. Further, overestimating GDP per capita is negatively correlated with support for aid to the target country and positively correlated with a country's perceived military threat. We discuss implications for inequality perceptions and for global economic justice.

“[. . .] we will lift Shanghai up and up, ever up, until it is just like Kansas City.”

- Kenneth Wherry, U.S. Senator for Nebraska, 1940

The economic gap between rich and poor countries is staggering. The most unequal country in the world is South Africa, with an income-inequality Gini index of 0.63 (World Bank, 2021). Recent estimates of global income inequality, that is, between-country income inequality, also showed a Gini index of 0.63 (Milanovic, 2021), which makes the world as unequal as the most unequal country in it. However, we know little about perceptions of global inequality, as research about inequality perceptions has usually investigated within-country inequality (Niehues, 2014; Norton and Ariely, 2011). The present article shows that Westerners overestimate how rich developing and middle-income countries are, meaning that Westerners underestimate global inequality. They seem to think that Senator Wherry's dream is much closer to reality than it is.

1. Inequality perceptions

A large literature investigates estimates of income inequality in a single country and finds that people largely misperceive inequality. In the USA, people either underestimate inequality (Norton and Ariely, 2011) or they overestimate it (Chambers et al., 2014; Eriksson and Simpson, 2013). This literature also

investigates the *racial wealth gap* within the USA, showing that U.S. Americans vastly underestimate inequality between Black and White Americans (Kraus et al., 2017), a misconception that proves difficult to correct (Callaghan et al., 2021; Kraus et al., 2022; Onyeador et al., 2021). This is not unique to the USA; other North Americans, South Americans, and Europeans misperceive inequality in their own countries (Cruces et al., 2013; Fernández-Albertos and Kuo, 2015; Niehues, 2014). In fact, people all over the world seem to perceive inequality incorrectly, over- or underestimating it depending on how it is measured (Gimpelson and Treisman, 2018; Ziano et al., 2022; Ziano and Villanova, 2022). One source of variation is the low understandability of several measures of inequality which drives people to misestimations in both directions (Heiserman and Simpson, 2021). A common thread in this research is that—even when the participants came from several countries (as in Niehues, 2014)—all participants misperceived inequality in the country in which they lived. Little work has explored perceptions of inequality between countries, focusing instead on individual comparisons (Cullen and Perez-Truglia, 2022; Fehr et al., 2022; Nair, 2018). Our research takes a first step towards filling this gap by focusing on perceptions of global inequality.

Prior work has also measured people's estimates of economic inequality over time (e.g., racial inequality; Kraus et al., 2022), finding that people have overly optimistic views, mistakenly indicating that the racial wealth gap in the USA has greatly decreased over time. This might be because people tend to assume historical improvement in certain indicators (e.g., human happiness; Hillman et al., 2023). However, people also tend to assume that historical decline happens in other domains (e.g., human morality; Mastroianni and Gilbert, 2023). Our research also measures people's estimates of between-country income inequality has evolved over time, to test whether people are victims of a convergence illusion, that is, the false beliefs that poorer countries have become closer economically to richer countries over time.

In addition, estimates of other countries' income may also be associated with political attitudes towards them. For instance, perceiving more inequality is associated with favoring redistribution (Niehues, 2014), so it follows that, the larger the overestimate of another country's economic standing, the less people may support sending it economic aid. Gross domestic product (GDP) is positively correlated with military spending, as richer countries have more money to spend on defense. It is therefore possible that the more people overestimate how rich a certain country is, the more they perceive it as a military threat. Finally, people tend to migrate from poorer to richer countries. Thus, it is possible that citizens of rich countries overestimate the economic standing of poorer countries, and that such overestimates would be negatively correlated with attitudes towards migration from the target country to a given richer country.

2. Study overview

We conducted 6 studies (total $N = 2656$, 5 preregistered; summarized in Table 1) with U.S. American, British, and French participants. Study 1 (incentivized for accuracy) tested the overestimation of various measures of economic development, in several developing and middle-income countries (in comparison to the USA) in a representative sample of U.S. American participants. Study 2 tested whether U.S. Americans believe that GDP per capita in developing and middle-income countries is closer to the USA's than it actually is. Study 3 tested U.S. Americans' perceptions about developing and middle-income countries' rates of car ownership, house size, and weekly frequency of dining out, both in absolute and comparative estimation. Studies 4 and 5 investigate the possibility of a convergence illusion, testing French and British participants estimates of the economic gap between richer and poorer countries over the past few decades. Study 6 tests whether overestimates of the economic standing of poor and middle-income countries are correlated with attitudes toward aid, perceived military threat, and attitudes toward immigration from these countries. Data, analyses and materials are available at <https://osf.io/mzeqd>.

Table 1. Study overview.

Study	Sample (participants' country of residence)	Main result
Study 1	500 (USA)	Representative sample of U.S. American participants overestimate GDP per capita, car ownership rates, rooms per person, and frequency of eating out in developing and middle-income countries
Study 2	790 (USA)	U.S. American participants overestimate the GDP per capita of developing and middle-income countries, as well as wealthy European countries
Study 3	408 (USA)	U.S. American participants overestimate car ownership rates, rooms per person, and frequency of eating out in developing and middle-income countries, comparatively and in absolute terms.
Study 4	170 (France)	French participants overestimate the GDP per capita of developing and middle-income countries; believe that these countries have gotten closer to France over time
Study 5	389 (UK)	British participants overestimate the GDP per capita of developing and middle-income countries; believe that these countries have gotten closer to the UK over time
Study 6	399 (USA)	U.S. American participants' GDP per capita overestimation is negatively correlated with support for aid, and positively correlated with perceived military threat.

3. Methods and results

3.1. Study 1—U.S. Americans overestimate how rich poor and middle-income countries are

The objective of this study is to test the overestimation of various measures of wealth, in several developing and middle-income countries (compared to the USA) in a representative sample of U.S. American participants, incentivizing participants for accuracy. This study was preregistered at: <https://aspredicted.org/da86q.pdf>

3.1.1. Methods

3.1.1.1. Participants

A sample of 500 U.S. American participants, representative of the USA in terms of gender, age, and race were recruited from Prolific. Participants in this study were incentivized to provide accurate estimations and participants with the top 5% most accurate responses received a £2 bonus. Three participants failed the attention check by responding “Yes” to “Have you ever been on the planet Mars” and the final analysis included 497 participants ($M_{age} = 47.04$, $SD = 16.87$; 250 female, 238 male, 6 non-binary, 2 other and 1 prefer not to disclose; 306 Caucasian, 66 African American, 34 Asian, 52 Hispanic, 4 Native American, 2 Native Hawaiian or Pacific-Islander, and 29 2 or more races).

3.1.1.2. Procedure

In this study, we used GDP per capita at purchasing power parity (PPP) to correct for local differences in purchasing power as one of the measures of wealth. This indicator is computed and made available from the World Bank (World Bank, 2019). Participants were shown a definition of GDP per capita, at purchasing power parity (PPP). Then, they were asked to reply to 3 comprehension checks. Participants could not continue with the survey until they answered the comprehension checks correctly. Following

this, participants were presented with 7 countries in randomized order (Nigeria, Mexico, India, China, Brazil, Russia, and Turkey) and were asked to indicate how many GDP per capita (PPP) dollars they thought the target country had in 2022 for every \$100 of GDP per capita in 2022 in the USA, responded on a slider bounded at 0 and 200. The slider default position was on the point of parity between the two countries (100 in this study) for this and all studies.

Then, presented in randomized order, participants were asked to make a series of estimates regarding the number of cars (for China, India, Mexico, Nigeria, Brazil, and Russia), number of rooms per person (for Brazil, Mexico, Turkey, and Russia) and weekly frequency of dining out (for Russia, China, Turkey and India) for each of the target countries in comparative terms (with USA as the reference point). We chose these indicators because they are correlated with economic activity and income in a country (Bren d'Amour et al., 2020; Nolan, 2010; OECD, 2021) and they could be compared with the actual values as collected in international surveys (Kantar, 2021; OECD, 2021; Pew Research Center, 2015).

For these measures, participants were asked to estimate the proportion between the target country and the USA (adapting a method from Kraus et al., 2017). They were asked to estimate car ownership rate, rooms per person, and frequency of meals outside of the home on a slider bounded at 0 and 2, to compare the target country and the USA (here, the starting point of the slider was 1, the parity point). Note that no country scored double the USA on any metric (in fact the actual proportions were all below 1). For instance, when estimating the proportion in frequency of dining out, participants were shown these instructions: “Note that 1 means that people in the target country eat out with the same frequency that they do in the USA; 2 means that people in the target country eat out with double the frequency than in the USA, and numbers lower than 1 indicate that people in the target country eat out less frequently than in the USA.” Before the estimation, participants were also told that the 5% of answers closest to the correct answers would be given a £2 bonus.

3.1.2. Results and discussion

A series of one-sample *t*-tests of the estimates against the actual value of car ownership, weekly dining out frequency, number of rooms per person, and GDP per capita (PPP-adjusted) for the target countries in 2022 when compared to the USA indicated overestimation across all parameters, with effect sizes ranging from medium to very large. In this and all studies, *p*-values relative to one-sample *t*-tests are not corrected for multiple comparisons as tests are independent from each other (García-Pérez, 2023; Rubin, 2024). We do use Tukey corrections when dealing with post-hoc tests after an ANOVA with more than 2 levels per factor (see Studies 4 and 5). The findings of Study 1 are summarized in Figure 1

Actual and estimated values

2022 GDP per capita (PPP), ratio between target country and the USA
Estimation means and 95% confidence intervals are depicted

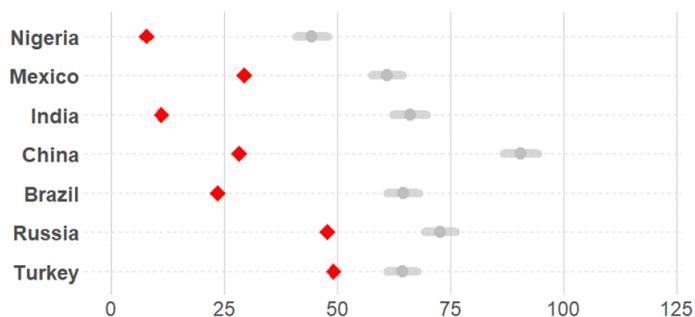


Figure 1. Comparing estimated and actual 2022 GDP per capita (PPP) (proportion compared to the USA), Study 1.

Table 2. Results of one-sample *t*-tests comparing estimated and actual GDP per capita (PPP) in 2022 (proportion compared to the USA), Study 1.

Target country	Actual proportion*	Estimated proportion <i>M</i> (SD)	Cohen's <i>d</i>
Nigeria	7.68	44.30 (37.15)	0.99***
Mexico	29.21	60.84 (35.60)	0.89***
India	11	65.95 (38.31)	1.43***
China	28.14	90.43 (40.28)	1.55***
Brazil	23.36	64.41 (37.29)	1.10***
Russia	47.57	72.66 (35.61)	0.71***
Turkey	49.06	64.23 (34.42)	0.44***

Note: *GDP per capita (PPP) in percentage points. ****p* < .001

Table 3. Results of one-sample *t*-tests comparing estimated and actual car ownership for target countries in 2022 (proportion compared to the USA), Study 1.

Target country	Actual proportion	Estimated proportion <i>M</i> (SD)	Cohen's <i>d</i>
China	19	69 (65)	0.76***
India	7	44 (58)	0.64***
Mexico	40	64 (57)	0.42***
Nigeria	20	31 (55)	0.20***
Brazil	53	70 (59)	0.29***
Russia	63	88 (56)	0.45***

Note: *** *p* < .001. The estimated values range from 0 to 2. The actual values were calculated by dividing the value of the target country by the value in the USA, as presented in Pew Research Center (2015).

Table 4. Results of one-sample *t*-tests comparing estimated and actual rooms per person in the target countries in 2022 (proportion compared to the USA), Study 1.

Target country	Actual proportion	Estimated proportion <i>M</i> (SD)	Cohen's <i>d</i>
Brazil	0.46	0.81 (0.65)	0.53***
Mexico	0.46	0.68 (0.68)	0.33***
Turkey	0.42	0.82 (0.60)	0.66***
Russia	0.42	0.97 (0.60)	0.92***

Note: *** *p* < .001. The estimated values range from 0 to 2. The actual values were calculated by dividing the value of the target country by the value in the USA as presented in OECD (2021).

and Table 2, 3, 4, and 5. Overall, these findings indicate that this representative sample of US Americans overestimated economic equality between developing and middle-income countries and the USA. This overestimation was reflected across all the parameters in our study.

This study shows that US Americans believe that people in other countries are much closer to US levels of economic development than they actually are. This shows that US Americans may have a biased view of the economic state of the world, believing that it is much more equal than it actually is. Interestingly, the rank order is also incorrect, with participants vastly overestimating China's standing and indicating it as the richest country of the lot, followed by Russia, India (another very large overestimation), Brazil, and only then Turkey (the actual richest country in the list), then Mexico (which

Table 5. Results of one-sample *t*-tests comparing estimated and actual frequency of dining out weekly in the target countries in 2022¹ (proportion compared to the USA), Study 1.

Target country	Actual proportion	Estimated proportion <i>M</i> (SD)	Cohen's <i>d</i>
Russia	0.14	0.70 (0.62)	0.91***
China	0.72	0.93 (0.71)	0.29***
India	0.31	0.64 (0.65)	0.51***

Note: *** $p < .001$. The estimated values range from 0 to 2. The actual values were calculated by dividing the value of the target country by the value in the USA as presented in Kantar (2021).

is richer than Brazil) and finally, Nigeria (though vastly overestimating its GDP per capita, participants correctly placed it at the bottom of the list).

3.2. Study 2—US Americans underestimate the economic difference between the USA and other poorer as well as wealthy European countries

Next, we wanted to examine if the overestimation of the economic standing of developing and middle-income countries further extends to relatively wealthy European countries (such as the UK and Poland). People might be more accurate in estimating the relative economic standing of these countries because they might be more familiar with them. Thus, the objective of this study is to replicate US Americans' overestimation of the economic standing of developing and middle-income countries and test whether this extends to the overestimation of the economic standing of wealthy European countries, using the proportion between GDP per capita of the target country and the USA.

3.2.1. Methods

3.2.1.1. Participants

We recruited 790 U.S. American participants from MTurk, who were paid \$1.00. Six participants were excluded after they failed the attention check, which left 784 participants (414 males, 362 females, 5 nonbinary people, 3 preferred not to disclose; $M_{\text{age}} = 40.47$, $SD = 12.70$).

3.2.1.2. Procedure

Similar to Study 1, this study adopted GDP per capita (PPP-adjusted) as a measure of economics standing. Three comprehension checks were put in place to ensure that the participants understood the definition of GDP per capita (PPP-adjusted) used in our study and participants could not continue to the survey until they responded correctly. Participants were then shown a short description of 9 countries (in randomized order; Brazil, China, France, India, Mexico, Nigeria, Poland, Russia, UK) and were instructed to indicate how many dollars of GDP per capita (PPP) they thought the target country had in 2019 for every \$100 of GDP per capita (PPP) in 2019 in the USA, on a slider bounded at 0 and 200 (a method adapted from Kraus et al., 2017). For instance, when the target country was the UK, participants were asked:

For every \$100 of GDP per capita (PPP) in 2019 in the USA, how many GDP per capita (PPP) dollars do you think the UK had in 2019?

Please reply on this slider. Note that 100 means that the USA and the UK had exactly the same GDP per capita (PPP) in this year.

¹Due to the lack of actual estimates for the weekly frequency of dining out in Turkey in the Kantar (2021) survey, Turkey was not included in the final analyses.

At the end of the survey, we also measured participants' ideology on one item bounded at 1 (very liberal) and 7 (very conservative).

3.2.2. Results and discussion

A series of one-sample *t*-tests comparing the actual and the estimated GDP per capita proportions showed overestimation across the board, and seemingly larger for developing and middle-income countries, and less so for richer countries (Table 6 and Figure 2). Ideology showed only small correlations with some of the estimations (being statistically significant only for UK and France, Pearson's $r = 0.08, p = .025$ and $r = 0.10, p = .006$ respectively, meaning more conservative participants were more likely to overestimate economic equality with the UK and France but ideology was unrelated to propensity to overestimate for the other countries; all other r s < 0.06 and all other p s $> .10$).

Table 6. Results of a series of one-sample *t*-tests comparing estimated and actual GDP per capita (PPP) in 2019 (proportion compared to the USA), Study 2.

Target country	Actual proportion	Estimated proportion <i>M</i> (SD)	Overestimation extent*	Cohen's <i>d</i>
Brazil	23	62.59 (32.07)	40	1.24***
China	26	91.66 (42.44)	76	1.55***
France	78	94.47 (27.39)	16	0.60***
India	11	61.41 (38.12)	50	1.32***
Mexico	32	57.17 (33.54)	25	0.75***
Nigeria	8	40.82 (35.51)	32	0.92***
Poland	54	72.39 (31.54)	18	0.58***
Russia	45	76.30 (34.36)	29	0.91***
UK	76	98.06 (27.17)	22	0.81***

Note: * GDP per capita (PPP) in percentage points; *** $p < .001$

Actual and estimated values

2019 GDP per capita (PPP), ratio between target country and the USA
 Estimation means and 95% confidence intervals are depicted

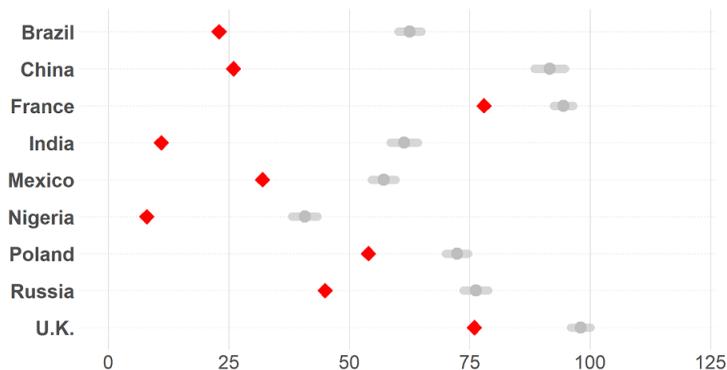


Figure 2. Comparing estimated and actual 2019 GDP per capita (PPP) (proportion compared to the USA), Study 2.

3.3. Study 3—US American overestimate car-ownership rates, rooms per person, and frequency of dining out in poorer countries

The objective of this study is to test whether people overestimate various measures of economic standing, in several developing and middle-income countries, both in absolute terms and compared to the USA. In addition to the comparative conditions in Studies 1 and 2, an absolute condition was added in this study. This was done to increase the generalizability of our findings and to ensure that anchoring participants' responses on a comparison country did not influence their estimates. Further, this allows us to test whether participants overestimate the absolute economic standing of other countries. This study was preregistered at https://aspredicted.org/RY2_DG2.

3.3.1. Methods

3.3.1.1. Participants

We recruited 408 U.S. American participants from Prolific, who were paid £0.60 for this task. Three participants were excluded after they failed the attention check, which left 405 valid participants (195 men, 202 women, 8 nonbinary people; $M_{\text{age}} = 32.74$, $SD = 12.49$; 281 Caucasian, 36 Black, 37 Asian, 38 Hispanic, 1 Native American, 9 two or more races, 3 no response).

3.3.1.2. Procedure

Participants were asked to make a series of estimates about the proportion of households who own a car (in China, India, Mexico, and Turkey); the number of people per room (in Brazil, Mexico, Russia, and Turkey); and the number of times per week in which people eat out, on average (in China, India, Indonesia, and Russia). Participants were randomly assigned to one of 2 conditions, absolute standing and comparative.

In the absolute standing condition, we asked participants to estimate absolute quantities (e.g., the absolute number of times that people eat out in Indonesia on a weekly basis). In the absolute standing condition, participants estimated car ownership rate on a slider bounded at 0 and 100. Participants estimated the number of rooms per person by inputting a number between 0 and 10 (with one decimal allowed). Participants estimated the weekly frequency of meals outside of the home by entering a number from 0 to 10 in a textbox (with one decimal allowed). We chose these boundaries as they represented the absolute possible limits in the estimation of the proportion of households with a car, and reasonable upper limits in the case of the other 2 estimations, considering the actual values (which hover around 1 for rooms per person, and at most 2.6 for weekly meals outside the house).

The comparative condition adopted the same procedure as Study 1. Participants were asked to estimate the proportion between the target country and the USA (adapting a method from Kraus et al. 2017), to gauge estimates of both the absolute standing of each country and the standing of each country relative to the USA.

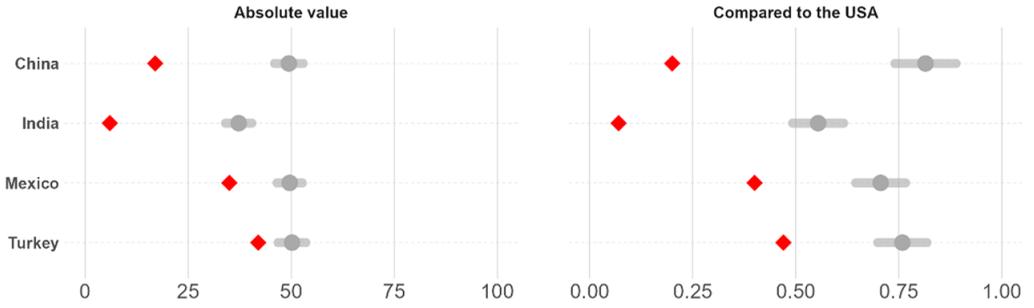
3.3.2. Results and discussion

We conducted a series of one-sample *t*-tests against the actual value of car ownership (for instance, participants reported that they believed that 49% of households in China own a car, while the actual value is 17%), weekly dining out frequency, and number of rooms per person, finding gross overestimation in all cases, with effect sizes ranging from medium to very large. Similarly, participants overestimated these values when they had to make a comparison between the USA and the target country (for instance, they believed that the ratio between the proportion of households with a car in China and in the USA was 0.82, while the actual value is 0.20). These results are summarized in Figure 3 and Tables 7, 8, and 9. Overall, this study shows that U.S. Americans overestimate the number of households with a working car, the number of times people eat out per week, and the number of rooms per person in poorer countries, both when they have to make estimates in absolute numbers and when they have to compare the target country to their own (the USA).

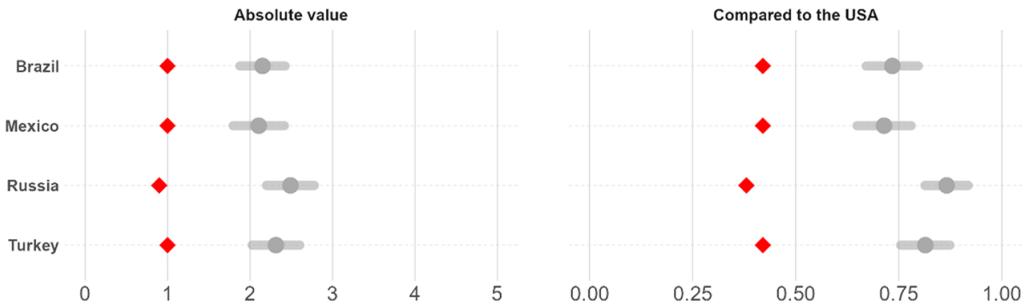
Actual and estimated values

Estimated means and 95% confidence intervals are depicted
Estimates were provided by two different subsamples

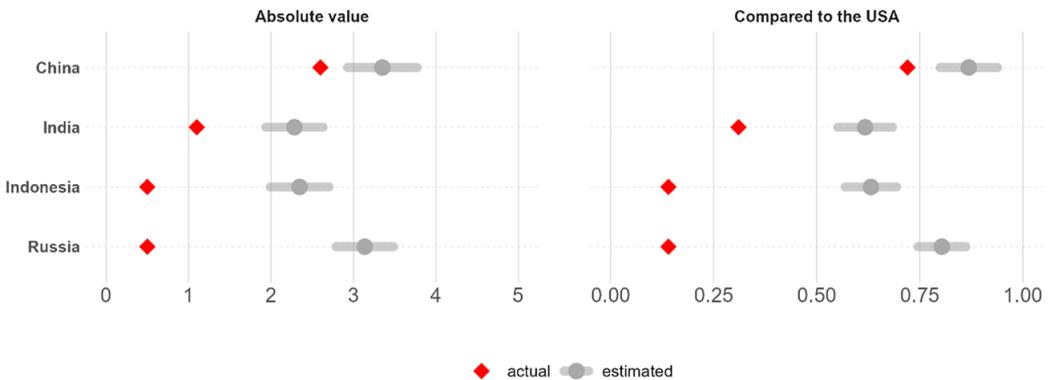
Proportion of households with a car



Rooms per person



Weekly dining out frequency



◆ actual ● estimated

Figure 3. Actual and estimated car ownership, rooms per person, and weekly dining out frequency, both as absolute values and compared to the USA, Study 3.

Table 7. One-sample *t*-test results comparing actual (Pew Research Center, 2015) and estimated car ownership, both compared to the USA and in percentage.

Country	Absolute values			Compared to the USA		
	Actual value	Estimate <i>M</i> (SD)	Cohen's <i>d</i>	Actual proportion	Estimate <i>M</i> (SD)	Cohen's <i>d</i>
China	17	49.45 (21.55)	1.51***	0.20	0.82 (0.47)	1.32***
India	6	37.27 (19.90)	1.57***	0.07	0.55 (0.39)	1.24***
Mexico	35	49.65 (19.06)	0.77***	0.40	0.71 (0.38)	0.81***
Turkey	42	50.21 (20.82)	0.39***	0.47	0.76 (0.38)	0.77***

Note: *** $p < .001$. The values in the comparative condition range from 0 to 2, while the numbers in the absolute values conditions could range from 0 to 100. In the absolute condition, the actual values were drawn from research conducted by the Pew Research Center (2015). In the comparative condition, the actual values were calculated by dividing the value of the target country by the value in the USA, as presented in Pew Research Center (2015).

Table 8. One-sample *t*-test results comparing actual (OECD, 2021) and estimated rooms per person, both compared to the USA and in absolute numbers.

Country	Absolute values			Compared to the USA		
	Actual value	Estimate <i>M</i> (SD)	Cohen's <i>d</i>	Actual proportion	Estimate <i>M</i> (SD)	Cohen's <i>d</i>
Brazil	1	2.15 (1.70)	0.68***	0.42	0.73 (0.40)	0.79***
Mexico	1	2.11 (1.93)	0.57***	0.42	0.71 (0.41)	0.71***
Russia	0.9	2.49 (1.81)	0.88***	0.38	0.87 (0.33)	1.35***
Turkey	1	2.15 (1.70)	0.68***	0.42	0.73 (0.40)	0.79***

Note: *** $p < .001$. The values in the comparative condition range from 0 to 2, while the numbers in the absolute values condition range from 0 to 100. In the absolute condition, the actual values were drawn from OECD (2021). In the comparative condition, the actual values were calculated by dividing the value of the target country by the value in the USA as presented in OECD (2021).

Table 9. One-sample *t*-test results comparing actual (Kantar, 2021) and estimated frequency of dining out per person, both compared to the USA and in absolute numbers.

Country	Absolute values			Compared to the USA		
	Actual value	Estimate <i>M</i> (SD)	Cohen's <i>d</i>	Actual proportion	Estimate <i>M</i> (SD)	Cohen's <i>d</i>
China	2.6	3.35 (2.62)	0.29***	0.72	0.87 (0.44)	0.34***
India	1.1	2.29 (2.15)	0.55***	0.31	0.62 (0.42)	0.74***
Indonesia	0.5	2.35 (2.21)	0.84***	0.14	0.63 (0.39)	1.25***
Russia	0.5	3.14 (2.17)	1.22***	0.14	0.80 (0.37)	1.82***

Note: *** $p < .001$. The values in the comparative condition range from 0 to 2, while the values in the absolute condition could range from 0 to 10. In the absolute condition, the actual values were drawn from Kantar (2021). In the comparative condition, the actual values were calculated by dividing the value of the target country by the value in the USA as presented in Kantar (2021).

3.4. Study 4—French students underestimate the economic difference between France and poorer countries and overestimate its improvement over time

The objective of this study was to test what French students think of the economic standing of other countries compared to France (to replicate previous results in a non-Anglophone Western population), and measure whether they believe that the gap between richer and poorer

countries has closed in the past decades, and to what extent. This study was preregistered at <https://aspredicted.org/blind.php?x=24hs2u>.

3.4.1. Methods

3.4.1.1. Participants and attention checks

We recruited 170 participants (66 males, 103 females, 1 other, $M_{\text{age}} = 22.61$, $SD_{\text{age}} = 6.07$; 142 of French nationality) from a French business school, who participated for course credit. None failed the attention check, therefore we retained all of them for analyses.

3.4.1.2. Procedure

Participants were first provided with a definition of GDP per capita (PPP). Then, participants were presented with 3 comprehension checks, which they had to correctly answer to proceed with the survey.

3.4.1.3. Measures

Participants were shown 7 countries in randomized order (China, India, Mexico, Nigeria, Poland, UK, and USA). For each country, they were asked to estimate the proportion of GDP per capita (PPP) between France and the country, in 1979², 1999, and 2019 on a slider bounded at 0 and 200, using a method similar to the one used in Study 2. Note that, for each time point, we asked participants to compare France at that time point with the target country at that time point. For instance, for Mexico in 1999, participants were asked:

For every \$100 of GDP per capita (PPP) in 1999 in France, how many GDP per capita (PPP) dollars do you think Mexico had in 1999?

Please reply on this slider. Note that 100 means that France and Mexico had exactly the same GDP per capita (PPP) in this year.

3.4.2. Results and discussion

A series of one-sample *t*-tests comparing the actual and the estimated GDP per capita proportions showed overestimation across the board, and seemingly larger for developing (e.g., India, Nigeria) and middle-income countries (e.g., China, Mexico) compared to richer countries (e.g., UK; [Figure 4](#) and [Table 10](#)). These results replicate the results of Study 1 and 2 with participants from a different Western country. While participants had a broadly correct view of the rank-order of countries (e.g., they seemed to know that China is richer than India, and that India is richer than Nigeria, but there were exceptions regarding Poland and Mexico), there seems to be massive overestimation of the economic standing of countries poorer than France. Specifically, the case of China stands out, as participants believed that in 2019, China's GDP per capita was basically on the same level as France's. Further, it seems that participants believe that poorer countries have been "catching up" with richer ones to a larger extent than they actually have been (if at all), as evidenced by the increase in almost all the estimated values in 1999 and in 2019. Participants also overestimated how rich the UK and Poland were compared to France, though they underestimated how rich the USA was compared to France, especially in 1999.

Exploratory analyses about the convergence illusion. To corroborate some of the qualitative, descriptive insights we summarize above, we ran a non-preregistered repeated-measures ANOVA with target country and target year (this time including 1979) as factors. We found main effects of target country, $F(6, 1008) = 187.40$, $p < .001$, $\eta^2 = 0.331$, and target year, $F(2, 336) = 157.28$, $p < .001$, $\eta^2 = 0.030$, and an interaction between the two, $F(12, 2016) = 44.41$, $p < .001$, $\eta^2 = 0.015$. Tukey-corrected post-hoc tests found that participants made lower estimates of the proportion of the target country compared to that of France in 1979 ($M = 66.08$, $SD = 26.99$) compared to both 1999 ($M = 75.60$, $SD = 22.69$) and 2019 ($M = 84.89$, $SD = 19.95$), and lower in 1999 compared to

²In the analyses, we did not use the 1979 datapoint as the World Bank database does not contain GDP per capita (PPP) before 1990.

Actual and estimated ratios...

GDP per capita (PPP), ratio between target country and France in given year
 Estimation means and 95% confidence intervals are depicted

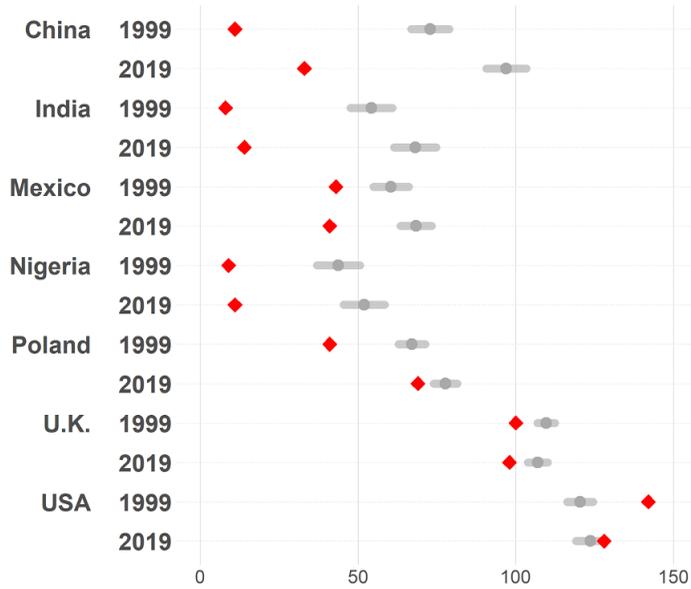


Figure 4. Real and estimated GDP per capita (PPP) of 7 countries in proportion to France’s GDP per capita (PPP), in 1999 and 2019, Study 4.

Table 10. One-sample t-tests comparing real and estimated GDP per capita (PPP) in proportion with France’s GDP per capita (PPP), in 1999 and 2019, Study 3.

Target country	Year	Actual proportion	Estimated proportion M (SD)	Overestimation extent*	Cohen’s d
China	1999	11	72.88 (38.19)	62	1.62***
	2019	33	96.97 (40.35)	64	1.59***
India	1999	8	54.30 (42.25)	44	1.10***
	2019	14	68.12 (42.75)	54	1.27***
Mexico	1999	43	60.48 (35.57)	23	0.49***
	2019	41	68.38 (31.43)	27	0.87***
Nigeria	1999	9	43.81 (43.21)	35	0.81***
	2019	11	51.94 (41.48)	41	0.99***
Poland	1999	41	67.12 (26.77)	26	0.98***
	2019	69	77.74 (23.95)	9	0.37***
UK	1999	100	109.62 (17.63)	9	0.55***
	2019	98	106.97 (19.74)	9	0.45***
USA	1999	142	120.40 (26.31)	-22	-0.82***
	2019	128	123.63 (28.84)	-4	-0.15*

Note: *France GDP per capita (PPP) in percentage points; *** $p < .001$; * $p < .05$

2019 (all at $p < .001$). In fact, while some countries (e.g., China) did catch up to France’s GDP, the proportion with some others (e.g., Mexico, Nigeria) stayed about the same, showing evidence in favor of a convergence illusion.

3.5. Study 5—British people underestimate the economic difference between the UK and poorer countries and overestimate its improvement over time

The objective of this study is to test whether an illusion of convergence underlies people's overestimation of GDP per capita, in a third country (UK), using 3 different time-points. This study was preregistered at https://aspredicted.org/28X_X7J.

3.5.1. Methods

3.5.1.1. Participants

We recruited 389 British participants from Prolific, who were paid £0.70 for this task. Two participants failed the attention check and were excluded from analyses, which left 387 participants (84 males, 299 females, 4 others; $M_{\text{age}} = 31.67$, $SD = 9.65$).

3.5.1.2. Procedure

Participants were first provided with a definition of GDP per capita (PPP). Then, participants were presented with 3 comprehension checks, which they had to correctly answer to proceed with the survey. Participants were shown 6 countries in randomized order (Brazil, China, India, Mexico, Nigeria, and Russia). Per each country, they were asked to estimate the proportion of GDP per capita (PPP) between the UK and the target country, in 1999, 2009, and 2019 on a slider bounded at 0 and 200, as in previous studies. Similar to Study 4, for each time point, we asked participants to compare the UK at that time point with the target country at that time point. For instance, in Nigeria in 1999, participants were asked:

For every \$100 of GDP per capita (PPP) in 1999 in the UK, how many GDP per capita (PPP) dollars do you think Nigeria had in 1999?

Please reply on this slider. Note that 100 means that Nigeria and the UK had exactly the same GDP per capita (PPP) this year.

3.5.2. Results and discussion

A series of one-sample *t*-tests comparing the actual and estimated GDP per capita proportions showed overestimation across the board (Figure 5 and Table 11). In sum, this study shows that people overestimate the extent to which developing and middle-income countries are catching up with industrialized countries, and that this is exacerbated by an illusion of convergence which posits that inequality has massively reduced in the past 2 decades. We wish to highlight how participants estimated that the GDP per capita (PPP) of China in both 2009 and 2019 surpassed that of the UK, the largest overestimation in this study.

3.5.3. Exploratory analyses about the convergence illusion

To corroborate some of the qualitative, descriptive insights we summarize above, we ran a non-preregistered repeated-measures ANOVA with target country and target year as factors. We found main effects of target country, $F(5, 1930) = 211.31$, $p < .001$, $\eta^2 = 0.167$, and target year, $F(2, 772) = 272.09$, $p < .001$, $\eta^2 = 0.036$, and an interaction between the two, $F(10, 3860) = 10.86$, $p < .001$, $\eta^2 = 0.002$. Of interest, Tukey-corrected post-hoc tests found that participants made lower estimates of the proportion of the target country compared to that of the UK in 1999 ($M = 65.38$, $SD = 28.32$) compared to both 2009 ($M = 76.46$, $SD = 26.96$) and 2019 ($M = 85.08$, $SD = 26.63$), and lower in 2009 compared to 2019 (all at $p < .001$). In fact, while some countries (e.g., China, Russia) did catch up to the UK's GDP, the proportion with some others (e.g., Mexico, India) stayed about the same over the timespan we considered, showing evidence in favor of a convergence illusion.

Actual and estimated values

Ratio of GDP per capita (PPP) of target country and the UK, in given year

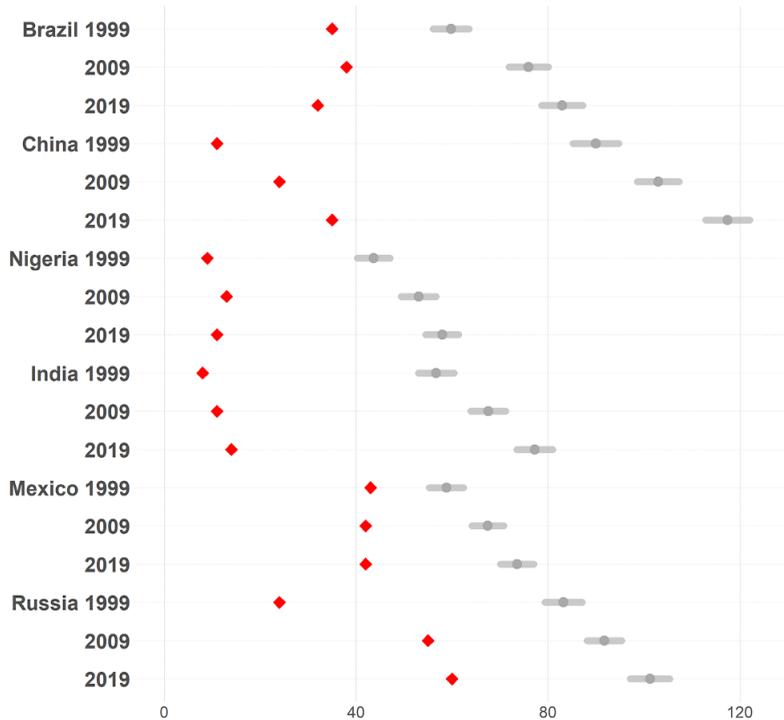


Figure 5. Actual and estimated proportion between GDP per capita (PPP) of target country and of the UK, Study 5. Estimated means and 95% confidence intervals around the estimation are depicted.

3.6. Study 6—Overestimating the economic standing of other countries correlates with attitudes toward aid and perceived military threat

The objective of this study is to test whether the underestimation of GDP per capita correlates with attitudes toward economic aid from one country to other countries, perceived military threat, and attitudes toward immigration from those countries. This study was preregistered at https://aspredicted.org/1DP_BVC.

3.6.1. Methods

3.6.1.1. Participants

We recruited 399 U.S. American participants from Prolific, who were paid £0.60 for this task. No participants failed the attention check; all participants (105 males, 282 females, 9 nonbinary people, 1 other, 2 preferred not to disclose; $M_{\text{age}} = 27.26$, $SD = 8.45$) were included in the analyses.

3.6.1.2. Procedure

As in previous studies, participants were shown a short definition of GDP per capita (PPP). Then, participants replied to 3 comprehension checks. They could not continue with the survey until they replied correctly. Then, participants were shown 6 countries, in randomized order (Brazil, China, India, Mexico, Nigeria, and Russia). Per each country, they were asked to indicate how many GDP per capita (PPP) dollars they thought the target country had in 2019 for every \$100 of GDP per capita in 2019 in

Table 11. Actual and estimated proportion between GDP per capita (PPP) of target country and of the UK, Study 5.

Target country	Year	Actual proportion	Estimated proportion <i>M</i> (SD)	Overestimation extent*	Cohen's <i>d</i>
Brazil	1999	35	59.80 (36.29)	25	0.68***
	2009	38	75.98 (40.08)	38	0.95***
	2019	32	82.96 (41.58)	51	1.23***
China	1999	11	90.01 (46.34)	79	1.71***
	2009	24	103.00 (42.45)	89	1.86***
	2019	35	117.44 (44.79)	82	1.84***
India	1999	8	56.72 (35.88)	49	1.36***
	2009	11	67.56 (35.62)	57	1.59***
	2019	14	77.27 (36.30)	63	1.74***
Nigeria	1999	9	43.67 (33.33)	35	1.04***
	2009	13	53.05 (35.26)	40	1.14***
	2019	11	57.97 (33.51)	47	1.40***
Mexico	1999	43	58.84 (34.71)	16	0.46***
	2009	42	67.46 (32.20)	25	0.79***
	2019	42	73.55 (33.66)	22	0.94***
Russia	1999	24	83.23 (37.96)	59	1.57***
	2009	55	91.73 (35.09)	37	1.05**
	2019	60	101.27 (40.14)	41	1.03***

Note: *UK GDP per capita (PPP) in percentage points; *** $p < .001$

the USA, on a slider bounded at 0 and 200. Then, they were asked 3 questions per country, all anchored at 1 (not at all) and 7 (very much): “Do you think the USA should send aid to this country?”; “Do you think this country is a military threat to the USA?”, and “Do you think it should be easier for people in this country to immigrate to the USA?”

3.6.2. Results and discussion

A series of one-sample *t*-tests comparing the actual and the estimated GDP per capita proportions showed overestimation across the board, and seemingly larger for developing and middle-income countries compared to richer countries (Table 12). This study confirms that U.S. Americans overestimate global inequality, especially the economic standing of China, which they believe has higher GDP per capita (PPP) compared to the USA. Further, we ran a series of correlations between GDP estimation and political attitudes toward each target country (Table 13), finding statistically significant and small-to-medium correlations with attitudes toward aid (negative, meaning that the larger the perceived economic might of a country, the less likely people are to favor sending aid to the country) and perceived military threat (positive, meaning that the more a person perceives a country to be economically equivalent to the USA, the more they perceive that country to be a military threat). However, we found no sizeable or statistically significant correlation between the overestimation of GDP per capita and attitudes toward immigration from a country (except for China, for which the overestimation correlated positively, but weakly with favoring ease of immigration toward the USA). Overall, this study shows that GDP per capita estimation correlates with politically important attitudes, including attitudes toward aid and the perception of military threat. We found important heterogeneity both between measures and between associations of GDP per capita estimation across countries. For instance, for Nigeria we found a strong correlation between military threat and GDP overestimation ($r = 0.40$), but for Russia, a very weak one ($r = 0.01$), a finding deserving of further exploration in future research.

Table 12. Overestimation and results of one-sample *t*-tests, Study 5.

Target country	Actual proportion	Estimated proportion <i>M</i> (SD)	Overestimation extent*	Cohen's <i>d</i>
Brazil	23	71.82 (33.46)	49	1.46***
China	26	108.92 (40.68)	83	2.04***
India	11	73.67 (40.62)	63	1.54***
Mexico	32	66.22 (34.10)	34	1.00***
Nigeria	8	52.34 (38.17)	44	1.16***
Russia	45	95.43 (36.03)	50	1.40***

Note: *2019 U.S. GDP per capita (PPP) percentage points; *** $p < .001$

Table 13. Correlations between GDP estimation and attitudes toward aid, perceived military threat, and immigration in Study 5.

Target country	Correlation between estimation and aid	Correlation between estimation and military threat perception	Correlation between estimation and ease to immigrate
Brazil	-0.11*	0.20***	0.01
China	-0.12*	0.07	0.11*
India	-0.21***	0.16**	0.09
Mexico	-0.14**	0.19***	-0.01
Nigeria	-0.19***	0.40***	0.09
Russia	0.02	0.01	0.07

Note: *** $p < .001$; ** $p < .01$; * $p < .05$

4. General discussion

The present work shows that Westerners (British and U.S. Americans members of the public, and French students) underestimate global inequality. They believe that developing and middle-income countries have higher rates of car ownership, larger houses, and eat out more frequently than they actually do, both in absolute and comparative estimates. Further, people believe that developing and middle-income countries' GDP per capita is much closer to the developed countries where participants live (the USA, the UK, and France) than it actually is. We also find evidence in favor of a convergence illusion: participants believed that poorer countries closed the GDP gap very fast in the past decades and are well on their way to reaching equality with richer countries. Finally, we show that overestimating GDP per capita correlates negatively with support for aid for other countries and positively with perceived military threat of other countries.

4.1. Theoretical and practical implications

The present work provides a first look at perceptions of global inequality by describing what Westerners think of other countries' standard of living and showing that they vastly overestimate it. This finding advances the literature on perceptions of inequality, which has focused on within-country perceptions (Kraus et al., 2017, 2019; Niehues, 2014). It is especially striking to look at the estimation regarding China's economic standing, which French, British, and U.S. American participants believed was at the same economic level as or richer than France, the UK, and the USA, respectively. Further, the present work shows that such overestimations are negatively associated with attitudes toward international aid, and positively associated with perceived military threat (but we found little evidence that it correlates

with attitudes towards whether immigration from the country should be easier), showing theoretically interesting consequences of such overestimations. It seems that the overestimation of the economic position of a country may stand in the way of increased support for international cooperation.

Prior research found that people tend to be pessimistic about the current state of affairs, ranging from crime to homelessness to poverty rates (Mitchell and Tetlock, 2023), including the economic progress made by poor countries in recent years (Rosling, 2018). The present work nuances this claim. When asked about the economic state of poorer countries over time, our participants not only tended to overestimate how close poor countries are to rich countries but they also indicated that these countries were getting closer and closer to rich countries over time. This indicates that people are optimistic about the state of global inequality. Furthermore, our work also shows that people tend to overestimate consumption patterns of poor and middle-income countries (e.g., car ownership rates, frequency of dining out), meaning that they are optimistic about the economic state of these countries.

The present work has practical implications for global economic justice. If Westerners' perceptions of other countries economic standing is so biased, it is unsurprising that little progress has been made toward global income convergence compared to the hopes voiced, among others, by Senator Wherry in 1940 and by several leaders of poorer countries more recently (United Nations, 2020). Further, it points out that overestimates of other countries' economic standing may go hand in hand with important international attitudes. Perhaps, making economic perceptions more accurate would push rich countries' public opinion towards a higher degree of aid and toward military *détente*, and in turn, influence their governments.

4.2. Limitations and future research

4.2.1. Measures

We measured people's perceptions of economic inequality by using GDP per capita and several other measures that correlate with GDP but refer to everyday people's experiences, both in comparison with participants' countries and in absolute terms. Nonetheless, it is possible that other measures (e.g., internet accessibility, years of schooling) would yield different results. We welcome extensions of our research to these other measures of human economic activity.

4.2.2. Optimistic about poor countries or pessimistic about rich countries?

Our participants tended to be optimistic about the economic standing of middle and low-income countries, as evidenced by the results of the absolute estimation condition in Study 3. Here, participants overestimated disparate absolute measures of economic activity, such as rooms per person, car ownership, and frequency of dining out, in poor and middle-income countries. Nonetheless, in other studies, we measure economic activity in relative terms. While these studies provide evidence in favor of our main contention, i.e., underestimation of global economic inequality, they cannot tell us whether people are underestimating their own country's absolute economic standing. We welcome future research yielding more insight into these important questions.

4.2.3. What does the Global South think?

In this research, we recruited Western participants. Future research should survey how people in developing and middle-income countries estimate their global economic standing, both compared to each other and to developed countries. Specifically, research should investigate whether their assessments as biased as the ones in richer countries, and if so, in which direction.

4.2.4. Debiasing

We found evidence of underestimation of global inequality. It would be interesting to investigate whether there are methods to reduce global inequality misperceptions or if these are as resilient as misperceptions about the Black-White wealth gap in the USA (Onyeodor et al., 2021).

4.2.5. Psychological mechanism

It is also possible that one cause of our results is *projection*, i.e., the notion that people do not know much about other countries' standing, therefore they project their estimates of their own country to other countries, and then they mix their estimate with information that they receive from the outside world or that they have learnt in the past. In other words, participants start by *anchoring* their estimate at parity and then *adjust* it based on other information. We encourage future research to investigate this interesting possibility.

4.2.6. Consequences

We found substantial variation across correlations between overestimation of the economic standing of other countries and attitudes regarding aid and perceived military threat (for instance, for Nigeria we found a strong correlation between perceived military threat and GDP per capita overestimation, $r = 0.40$, but for Russia, a very weak one, $r = 0.01$). One possibility is the presence of ceiling effects regarding military threat regarding Russia and China, which seems possible given that our participants in Study 6 were U.S. Americans, who tend to consider Russia and China as geopolitical and military rivals in this historical moment. Future research may investigate this and other reasons behind this heterogeneity.

5. Conclusion

Ultimately, these findings document Westerners' profound misunderstanding of global economic disparities and may help explain the persistence of global inequality and conflict. Hopefully, they are the first step of a series of papers that will document perceptions, beliefs, and aspirations about global inequality.

Data availability statement. Data, analyses and materials are available at <https://osf.io/mzeqd>.

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