Replication of Kraus et al 2017,
"Americans misperceive racial economic equality"
PNAS, 2017, 114 (39), 10324-10331.
http://www.pnas.org/content/114/39/10324

The original paper includes multiple studies but only one on MTurk. In this within-subject experiment, participants are asked to estimate how much an average black family earned for each $100 earned by an average white family. First, they are concurrently asked to estimate this inequality in 1947 and in 2013. Thereafter, participants are asked to bring to mind a black individual or family who is similar to them in terms of goals, talents, attributes, and skills ("Similarity") and to estimate this inequality again or to consider an "alternative United States," i.e., an America where discrimination based on race still exists in law enforcement, voting rights, and educational and employment decisions ("Discriminatory USA") and to estimate this inequality again. All participants answer the 1947/2013 question first and then both other questions, but the order of whether they see the Similarity or the Discriminatory USA question first is randomized and counterbalanced. The authors define Overestimation in the following way: "Overestimates were calculated by subtracting actual past or current equality levels based on the CPS from participants' estimates in each condition." Inducing consideration of the persistence of racial discrimination in the United States results in estimates of racial income equality that are closer to reality.

Hypothesis to replicate and bet on: Inducing consideration of the persistence of racial discrimination in the United States reduces the overestimation of racial economic equality. To evaluate this hypothesis, the authors compare the overestimates of racial economic equality in the "Discriminatory USA" treatments with the overestimates of racial economic equality in the "Current" treatment (i.e., the participants' current perception of racial economic equality). The authors test the above hypothesis using a paired *t*-test, $t(201) = 17.51$, $p < 0.001$, $d_{RM} = 0.50$; p. 10329. Note, however, the test could not be replicated using the original dataset. When testing estimates of equality of "Discriminatory USA" and "Current" using a paired *t*-test, the test statistic we calculate is $t(201) = 7.0258$, $p < 0.001$. The reporting error in the original paper has also been acknowledged by the original authors. We thus base our power analysis on the latter test statistic.

Criteria for replication: The criteria for replication are an effect in the same direction as the original study and a p-value < 0.05 (two-sided t-test).

Power analysis: The original study had 202 US-based subjects. The standardized effect size (Cohen's *d*) was $d = 0.494$. To have 90% power to detect 67% of the original effect size, a total sample size of $n = 97$ is required. Since we require the replication sample size to be at least as large as in the original study, the replication experiment will use a sample size of $n = 202$ and the power will thus be >90% to detect 67% of the original effect size.

Sample: As in the original study, we will restrict our HITs to US participants. No information on drop-outs or missing data was provided in the original paper. We will make sure that participants can only participate once from the same account in this specific study, and we will only recruit participants with a HIT approval rate of 95% or above. We will also check all IP addresses via https://www.ipqualityscore.com/; and we will remove any participants where one or more of

the following is true: fraud score >= 85; TOR = True; VPN = True; Bot = True; abuse velocity = high. The replication sample size is the sample size after any exclusions of participants.

Materials: We will use the same material as in the original study. We will reprogram the original *Qualtrics* survey using the materials provided in an online OSF repository: https://osf.io/vvrsr/#.

Procedure: We will closely follow the procedure of the original experiment. The following summary of the experimental procedure is therefore largely based on the description of the experiment in the article (pp. 933-934) and the supplementary information in the OSF repository https://osf.io/vvrsr/#.

Participants will be recruited on MTurk for a 5-10 minute long study. Participants will first be shown a Captcha, and will thereafter provide informed consent. After this we will include an attention check that participants will need to pass to continue to the study. This attention check is in addition to any other potential attention check(s) used in the original study. Participants will be informed that the study is concerned with how "personality is related to various social judgments" and that participation will involve filling out surveys assessing their beliefs about society. Participants will be informed that they can skip any questions that they do not want to answer, with no loss of compensation or penalty.

Next, participants will be provided definitions for income and wealth. Thereafter, participants will be asked to respond to the following question: "For every $100 earned by an average White family, how much do you think was earned by an average Black family in 1947/2013? (100 would mean equality)"

Participants will then enter their estimates on a 0–200 scale for which a score of zero indicates that Black–White economic inequality is such that White individuals and families receive all economic resources whereas Black individuals and families receive none. In contrast, a score of 200 indicates that Black families and individuals earn double the economic resources of White individuals and families.

Thereafter, participants will be asked to answer two more questions with the same format. The order of the following two questions will be randomized and counterbalanced. One question will read: "Now instead of trying to accurately estimate what an average black family earned, try to think about a different version of the USA then the one you may have thought of for the last questions. In this version of the USA, discrimination based on race still happens in law enforcement, voting rights, and educational and employment decisions. In this alternate USA, for every $100 earned by an average white family, how much do you think was earned by an average black family? (100 would mean equality) _____ In 2013" and the other question will read: Think of a black family that is similar to your own family Now instead of thinking about an average black family, think about a black family that is similar to your own family in terms of goals, abilities, talents, and motivations. For every $100 earned by an average white family, how much do you think was earned by this black family that is similar to your own family? (100 would mean equality) _____ In 2013".

After responding to the economic items, participants will be asked to report their racial inequality estimates in South Africa as well as demographic information, including political orientation, happiness (ladder), gender, age, and educational attainment."

Lastly, the participants will be debriefed using a pre-written message regarding the background and purpose of this study.

Analysis: The analysis will be performed in line with how we interpret the analysis in the original paper. That is, we will compare the overestimates of racial income equality after the "Discriminatory USA" treatment and the overestimates of racial income equality after the "Current" treatment using a paired samples t-test.

Subject payments: We are standardizing payments across all replications so that studies have a certain show-up fee depending on the expected length of the study, with an hourly wage from the show-up fee of $8 and a minimum payment of $1 (for studies with incentive payment we use the same incentive payment as in the original study; and this payment is paid in addition to the show-up fee). If we have problems recruiting, we will increase the show-up fee.