

Investigating How High Economic Inequality Exacerbates Intergroup Prejudice

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Abstract

Rising economic inequality is associated with more prejudice. Little empirical data, however, investigates how inequality impacts individuals' psychological processing and, in turn, exacerbates prejudice. We hypothesized that higher economic inequality triggers beliefs that unequal economies are zero-sum and leads to beliefs that people are in competition for limited resources, which may ultimately exacerbate intergroup prejudice. Through 7 experiments (Studies 1-4 in the manuscript and 3 additional studies in the Supplement), we provide evidence that higher inequality increases prejudice against a wide range of outgroups: people of a different race, people of a different religion, people who speak a different language, immigrants/foreign workers, and people of a different socioeconomic status. Further, zero-sum beliefs and perceived competition serially mediate this relationship (Study 2). In Study 3, we investigated nuance in this hypothesized model by specifically testing whether higher economic inequality exacerbates racial/ethnic prejudice among a large, diverse sample of Asian, Black, Latinx, and White participants and find a similar pattern of results. In a final study (Study 4), we demonstrate that assuaging zero-sum and competition beliefs mitigates prejudice. Overall, we find that zero-sum beliefs and perceived competition may be a particularly important mechanism to consider when trying to understand the relationship between economic inequality and prejudice.

Key words: Economic inequality; competition; zero-sum beliefs; prejudice; intergroup relations

“An imbalance between rich and poor is the oldest and most fatal ailment of all republics.”

- Plutarch

Inequality at the Brink: How Inequality Exacerbates Prejudice

Economic inequality is large and growing in the U.S. When comparing across the seven advanced democratic nations (G7), the U.S. stands out as having the highest level of income inequality (Schaeffer, 2020; data from OECD). In fact, U.S. incomes are the most *unequal* since the Census Bureau started tracking them in 1967 (Telford, 2019) and the concentration of income among the wealthy has returned to levels seen in the “Roaring Twenties” – a time right before the Great Depression when the top 0.1% held close to 25% of total household wealth (Zucman, 2019; Saez & Zucman, 2020). Making matters worse, the COVID-19 pandemic has exacerbated inequality, leaving lower income families more vulnerable to death by COVID-19 and its economic shocks (Perry et al., 2021; Kantamneni, 2020). As warned by Plutarch, high levels of economic inequality are fatal to republics. Thus, the current levels of inequality in the U.S. may serve as a warning that our society may be on the brink of disaster.

Although economic inequality may lead to social disintegration along several domains (e.g., Wilkinson & Pickett, 2009), the current research investigates the impact of economic inequality on intergroup prejudice. Several theories suggest that economic inequality may increase intergroup prejudice (Esses & Dietz, 2007; Esses et al., 2006; Reuben et al., 2014; Wilson et al., 2020). Yet, little empirical data investigates *how* inequality impacts individuals’ psychological processing to yield increased prejudice. We suggest that higher inequality triggers beliefs that the economy is zero-sum – that economic success for some means failure for others. Heightened zero-sum beliefs, in turn, may trigger beliefs that people are in competition for limited resources, resulting in increased intergroup prejudice. Critically, this work investigates an

important yet understudied pathway in the cyclical relationship between prejudice and economic inequality.

The Cyclical Relationship Between Prejudice and Economic Inequality

Previous work has already documented that prejudice may exacerbate economic inequality between social groups. For example, present-day racial wealth inequality between Black and White Americans is rooted historically in slavery and compounded by racist ideals driving the failure of Reconstruction, Jim Crow laws, and persistent structural and interpersonal discrimination in employment, housing, banking, education, healthcare, etc. Extending beyond White-on-Black prejudice, we see a similar pattern emerge for a number of different social groups. Women are half as likely to be hired for a job in STEM fields than are men, and this hiring disparity is predicted by stereotypical beliefs about gender-related competence expectations (Reuben et al., 2014). Qualifications held by immigrants to the U.S. tend to be devalued during the application process (Esses & Dietz, 2007; Esses et al., 2006). LGBTQ+ people experience poverty at higher rates than non-LGBTQ+ people (Wilson et al., 2020). And the list goes on. Although the specifics regarding types of prejudice and the circumstances under which these prejudices are expressed are nuanced, the overall pattern is the same: prejudice can produce and exacerbate economic inequality between social groups.

Here, we investigate whether the reverse may also be true, with economic inequality exacerbating prejudice. Theorists such as Carl Marx (Reich, 1983) and Alexis de Tocqueville (1835/2003) argued that material differences may divide social groups, exacerbating prejudice and making economic inequality self-perpetuating. Additionally, system justification theory (Jost et al. 2004) and social dominance theory (Sidanius & Pratto, 1993) – both of which center around justifying the social hierarchy and asserting that certain groups are inherently superior to

others – suggest that people may justify and perpetuate economic inequality through prejudice and group-based social hierarchies. Further, several hypotheses suggest that economic inequality may lead to social disintegration by making social hierarchies and existing differences between social groups salient, which, in turn, may lead to derogation of others to achieve the ingroup's upward status goals (e.g., Sherif, 1956; Walasek & Brown, 2015; Wilkinson & Pickett, 2017). Overall, these theories suggest that high economic inequality may exacerbate intergroup prejudice.

Although several theories and some correlational data suggest that economic inequality may exacerbate prejudice, little experimental data documents this causal pattern nor the causal mechanism(s) through which this happens. We suggest that higher inequality exacerbates intergroup prejudice because it triggers beliefs that financial resources are zero-sum, which in turn triggers beliefs that people are in competition for limited resources.

Economic Inequality, Zero-Sum Beliefs, Perceived Competition, and Prejudice

We integrate literature on zero-sum beliefs and realistic group conflict theory to ground our proposed model. Zero-sum beliefs are the idea that one person's success directly implies another's failure (e.g., Aumann, 1987). Games like chess and tennis are zero-sum because when one player wins it implies that the other player has lost. People often apply this same assumption to the economy, assuming that one person's economic gains necessitate another's economic losses (Friedman & Friedman, 1990).

The belief the economy is zero-sum may be particularly salient under contexts of higher inequality (Davidai, 2022). This is because the unequal distribution of economic resources across the social hierarchy makes economic stratification salient (e.g., Kawachi & Subramanian, 2014; Walasek & Brown, 2015). Thus, if people are more aware of the vast differences between the

wealthy and the poor in contexts of high inequality, they may be more likely to use zero-sum beliefs to make sense of these differences.

In situations of high inequality, zero-sum beliefs exacerbate intergroup competition concerns, and these beliefs and concerns may be mutually reinforcing. That is, high inequality may exacerbate the belief that the amount of financial resources in the economy is fixed implying that if some gain, others must lose. As a result of this belief, people may become concerned they are competing for limited resources (for a similar argument see Buttrick & Oishi, 2017). Lending evidence to this possibility, research finds local contexts of economic inequality predict greater perceived competition for economic resources among residents (Sánchez-Rodriguez et al., 2019; Sommet et al., 2019). Together, this suggests that higher economic inequality may exacerbate both zero-sum beliefs and perceived competition.

Why might perceived competition and zero-sum beliefs exacerbate prejudice? We hypothesize that these attitudes may exacerbate group status-related concerns which, in turn, exacerbate prejudice. Realistic group conflict theory contends that competition for limited resources may, in part, explain prejudice and hostility between groups (Campbell, 1965). That is, people rely on social groups to optimally compete for resources for themselves and for their ingroup. As a result of competing for limited resources, groups may become hostile toward one another – especially if they believe another group gaining resources means their ingroup is losing resources. For example, in a classic social-psychological study, boys at a summer camp were randomly assigned to one of two teams and were asked to compete in various camp games (Sherif, 1956). Although the boys were previously amicable toward one another, the context of competing in teams against one another for prizes led to both physical and verbal hostility between the teams of boys. Further, past work finds that when dominant group members feel

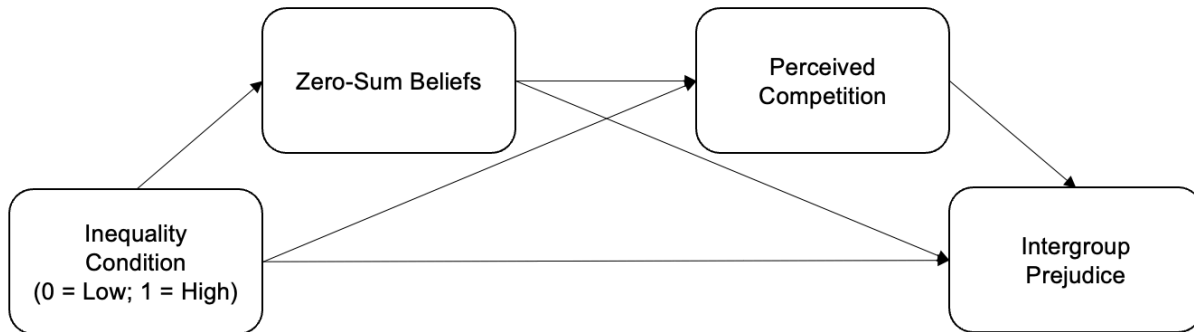
their status is threatened, they tend to react to this threat by regaining a sense of dominance through reinvigorated beliefs in the importance of the status quo, conservative ideology, and increased outgroup negativity (e.g., Craig & Richeson, 2014; Jost et al., 2004; Sidanius & Pratto, 1993). For example, when dominant group members perceive immigrants to threaten their economic livelihood (Esses et al., 2001), or perceive they will lose their numeric majority (Craig & Richeson, 2012, 2014; Outten et al., 2011), they tend to express more prejudicial beliefs toward outgroup members. Economic inequality may increase perceived competition; activating an approach-avoidance motivation whereby people may desire a higher status yet fear losing their current status (Hangen et al., 2016; Murayama & Elliot, 2012). Thus, both the desire to gain status and the fear of losing status may exacerbate intergroup hostility.

Overall, the reviewed theories and research suggests that high economic inequality may trigger increased zero-sum thinking, perceived competition, and, in turn, increase intergroup prejudice (see Figure 1 for depiction of theoretical model). While previous work has investigated the correlational relationship between inequality and White-on-Black prejudice (e.g., Connor et al., 2019; Hovland & Sears, 1940), the causal relationship between zero-sum beliefs and prejudice (e.g., Wilkins et al., 2015), and the causal relationship between perceived competition and prejudice (e.g., Sherif, 1956), previous research has not tested the full proposed model. Further, the majority of the previous work linking economic inequality to intergroup prejudice has focused on White-on-Black racial prejudice (Bianchi, 2020; Connor et al., 2019). While important, this work does not speak to whether economic inequality may increase intergroup prejudice across a wide range of social groups, and whether economic inequality may increase intergroup prejudice beyond White-on-Black prejudice. Thus, both breadth, in terms of understanding a wide range of prejudices, and depth, in terms of understanding nuance beyond

White-on-Black prejudice is needed to fully understand how economic inequality may be related to prejudice.

Figure 1

Theoretical Model



Does Racial/Ethnic Group Position Shape the Relationship between Economic Inequality and Racial/Ethnic Prejudice?

Although we anticipate this theoretical model to apply across different domains in which people may be the target of prejudice (e.g., racial/ethnic group, religious group, socioeconomic group, etc.), we also believe it is important to evaluate the performance of this model in the context of specific prejudices. To this end, we explore whether the proposed theoretical model can be used to explain the relationship between economic inequality and racial/ethnic prejudice. Critically, in our multiracial and multicultural world, we contend it is important to understand racial/ethnic prejudice beyond White-on-Black prejudice.

Racial/ethnic prejudice represents a unique and important situation in which to test our model given the long history of racism in the U.S., and that race/ethnicity is integrally linked with social status in the U.S. (e.g., Moller et al., 2009; Bobo & Hutchins, 1996). The Group Position Model (Blumer, 1958) suggests that White Americans' racial prejudice is exacerbated when they feel their group's superior position is being challenged (by Black Americans). Bobo

& Hutchings (1996) extended this model to understand a multicultural space, and their findings suggest that intergroup prejudice may emerge between minoritized groups (e.g., Black and Latinx Americans) to the extent that people of these groups feel they are competing against one another for resources. Together, this would suggest that high economic inequality may lead to greater intergroup prejudice across all racial/ethnic groups to the extent that people from these racial/ethnic groups perceive high economic inequality to create zero-sum circumstances which exacerbate competition between all racial/ethnic groups.

However, racial/ethnic prejudice may also provide important nuance to the proposed model as the dominant racial group, White Americans, may be particularly likely to express prejudice toward minoritized groups to maintain their power and the status quo (e.g., Sidanius & Pratto, 2001). Contemporary research suggests that White Americans may be particularly fearful of racial progress (e.g., Norton & Sommers, 2011) and may anticipate that their status is at risk (e.g., Craig & Richeson, 2014a; 2014b; 2018; Esses et al., 2001; Outten et al., 2012). This would suggest that high economic inequality may lead White Americans to express the most intergroup prejudice in response to high economic inequality as they may be particularly motivated to maintain their economic status. Regardless of the specific pattern of results, racial/ethnic prejudice represents a unique and important situation in which to test our model to understand *for whom* and *toward whom* economic inequality may exacerbate racial/ethnic prejudice.

Mitigating Zero-Sum and Competition Concerns for Economic Resources May Mitigate Prejudice

In addition to understanding whether economic inequality increases prejudice, it is essential to understand ways to mitigate this process. We expect that reducing zero-sum beliefs and perceived competition will reduce inequality's impact on prejudice. So, even if inequality is

perceived to be high, if people think their own group's economic situation is entirely independent of other groups' resources or success, other groups may no longer be seen as competitors, and this may reduce prejudice toward those groups.

Overview of the Current Research

To summarize, we hypothesize that higher economic inequality may trigger zero-sum beliefs and perceived competition which, in turn, may lead to increased intergroup prejudice. Extending beyond previous research, we (1) investigate the causal relationship between inequality and prejudice across a wide range of social groups: people of a different race, people of a different religion, people who speak a different language, immigrants/foreign workers, and people of a different socioeconomic status (Studies 1 and 2), (2) investigate nuances to the proposed mechanisms by focusing on race/ethnicity prejudice among a racially/ethnically diverse sample (Study 3), and (3) investigate a way to mitigate this relationship by assuaging economic competition concerns (Study 4). All studies were preregistered¹ and we follow preregistered analytic plans except when explicitly indicated. We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study. Preregistrations, study materials, data and analytic code can be found here:

https://osf.io/7hfpq/?view_only=2538cb735d9945beb937c827bec53a3d.

Study 1

Study 1 manipulated perceived economic inequality in participants' geographic regions. We predicted that high economic inequality, relative to low economic inequality, would cause greater perceived intergroup prejudice.

¹ Links to each pre-registration: Study 1: https://aspredicted.org/VL9_B89; Study 2: https://aspredicted.org/RVE_EMK; Study 3: https://aspredicted.org/WNS_FTK; Study 4: https://aspredicted.org/KXQ_QCE

Method

Statistical Power and Participants

An *a priori* power analysis indicated that for a two-condition between-subjects design, we would need a total sample size of $N = 352$ to detect a small-to-medium effect size (Cohen's $d = .30$) with adequate power ($1 - \beta = .80$; G*Power; Faul et al., 2009). We recruited 400 participants from Amazon Mechanical Turk using CloudResearch. After removing data from individuals who failed a robot check, attention checks and manipulation checks, our final sample consisted of 395 participants (58.2% women; 41.5% men; 0.3% other) who were on average 39.08 years of age ($SD = 11.71$). The racial/ethnic makeup of the participants was: 69.6% White or Caucasian, 8.1% Asian, 12.7% Black or African American, 6.6% Latinx, 2.8% mixed race, and 3.3% another race.

Procedure

After passing a robot CAPTCHA² and attention check, consenting participants were asked several items about their geographic location, finances, and demographics. These items included: “In which state do you currently reside?”, “How much do you spend on housing costs (including utilities)?”, “What is your highest level of education?” and a question asking for the name of the county and zip code in which the participant currently resided (for exact study materials see the Supplemental Materials). Participants were told that a sophisticated computer algorithm would use the responses they provided on these geographic, financial, and demographic items to calculate their “geographic economic inequality index.” Specifically, participants were told:

² CAPTCHA stands for Completely Automated Public Turing test to tell Computers and Humans Apart. This is a question that is simple for humans to answer correctly, yet difficult for computers to answer correctly. This question helps to filter computer algorithms from real participants.

The following survey is part of an ongoing project examining trends in economic inequality – or the distribution of money across society. You’ll be asked some questions about your geographic area and demographic questions. It is important that you be as accurate as you can.

At the end of this survey, using statistical analyses based on your responses and incorporating data from the US Census, we will provide you with feedback about the distribution of economic resources in your geographic area.

Unbeknownst to participants, after completing these items they were randomly assigned to either the *High Economic Inequality* condition or the *Low Economic Inequality* condition. The exact feedback for the two conditions is presented in Table 1. Critically, in the *High Economic Inequality* condition, participants were told that their index was 0.89, which means: “the distribution of economic resources for the geographic area you reside in is much **more unequal** than most parts of the U.S.” And, in the *Low Economic Inequality* condition, participants were told their index was 0.11, which means: “the distribution of economic resources for the geographic area you reside in is much **more equal** than most parts of the U.S.”

Table 1

Geographic Economic Resources Feedback, Study 1

Low Inequality Condition	High Inequality Condition
Your geographic area economic inequality index: 0.11	Your geographic area economic inequality index: 0.89

Interpreting your geographic area economic inequality index score: The distribution of economic resources for the geographic area you reside in is much **more equal** than most parts of the U.S. A score of zero means this area in the U.S. has the most equal distribution of resources across its residents. That is, all residents in this area have very similar socioeconomic standings. A score of one means this area in the U.S. has the most unequal distribution of resources across its residents. That is, some residents are making millions of dollars and have a much higher socioeconomic standing whereas other residents are living below the poverty line and have a much lower socioeconomic standing.

Interpreting your geographic area economic inequality index score: The distribution of economic resources for the geographic area you reside in is much **more unequal** than most parts of the U.S. A score of zero means this area in the U.S. has the most equal distribution of resources across its residents. That is, all residents in this area have very similar socioeconomic standings. A score of one means this area in the U.S. has the most unequal distribution of resources across its residents. That is, some residents are making millions of dollars and have a much higher socioeconomic standing whereas other residents are living below the poverty line and have a much lower socioeconomic standing.

Then, participants completed a prejudice measure assessing how much they think people in their geographic region would be willing to have people in different social groups as neighbors. We assessed perceived prejudice of people in one's geographic area (instead of participants' own prejudice) because previous research has shown that people regulate their expression of personally endorsed prejudice, whereas prejudice framed in terms of cultural knowledge produces more candid reports (e.g., Fiske et al., 2002). Further, past research has found that measures framed as group- (vs. personal-) endorsement were more strongly associated with implicit bias and application of stereotypes in behavior (e.g., Correll et al., 2002; Devine, 1989).

This measure of perceived prejudice asked participants to rate how willing they thought others in their geographic area would be to have people of a different race, people of a different religion, people who speak a different language, immigrants/foreign workers, and people of a different socioeconomic status as neighbors. It also asked how willing they thought people in

their geographic area would be to have “people who ARE in their social group” and “people who are NOT in their social group” as neighbors. All ratings were made on slider scales from 0 (*not at all*) to 100 (*extremely*). Participants concluded by reporting additional demographics, were debriefed, and were compensated for their time.

Results and Discussion

We predicted that participants would report that individuals in their geographic region would be less willing to have social outgroups as neighbors when in the high (vs. low) economic inequality condition. For analyses, we created two social closeness indexes by: 1) combining the ratings of all specific social outgroups ($\alpha = .91$), and 2) creating a difference score between people in one’s social group and people who are not in one’s social group (i.e., the combined ratings of all specific social outgroups).

As predicted, using the first index we calculated, participants in the high economic inequality condition ($M = 57.18$, $SD = 24.91$) reported that people in their region would want the various social outgroups as neighbors less than those in the low economic inequality ($M = 66.44$, $SD = 25.17$), $t(392.9) = 3.68$, $p < .001$, 95% CI [4.31, 14.22], $d = 0.37$.^{3,4} We find the same pattern when using the difference score between social in- and outgroups (broadly defined). Participants in the high economic inequality condition perceive that people in their geographic region would be more willing to live next-door to social ingroups, rather than outgroups ($M = 26.81$, $SD = 28.13$), more so than in the low economic inequality condition ($M = 20.51$, $SD = 24.55$), $t(386.47) = -2.37$, $p = .02$, 95% CI [-11.52, -1.08], $d = 0.24$. In sum, Study 1 suggests

³ For all analyses, when the assumption of equality of variances was violated, we report Welch’s t-test which corrects for this violation.

⁴ For all analyses, we investigated whether the results hold when controlling for SES, race, and political ideology. The results persist when these covariates are included in the model.

that perceiving high inequality in one's region increased perceptions of prejudice towards outgroups.

Study 2

In Study 2, we intended to replicate and extend Study 1 by examining the processes that mediate the relationship between inequality and prejudice. In particular, we examine zero-sum beliefs and perceived competition between groups as potential mediators.

Method

Statistical Power and Participants

An *a priori* power analysis indicated that for a two-condition between-subjects design, we would need a total sample size of $N = 352$ to detect a small-to-medium effect size (Cohen's $d = .30$) with adequate power ($1 - \beta = .80$; G*Power; Faul et al., 2009). We recruited 450 U.S. participants from Amazon Mechanical Turk using CloudResearch. After removing data from individuals who failed a robot check, attention checks and manipulation checks, our final sample consisted of 422 participants who were on average 39.55 years old. A majority of participants identified as White (71.56%, 10.66% Black, 9.24% Asian, 0.47% Native American, 2.61% multiracial, and 0.47% other) and female (54.03%, 45.02% male, and 0.95% other). Participants' ages ranged from 18 to 77 years ($M = 39.55$, $SD = 12.45$).

Procedure

The procedure for Study 2 was identical to Study 1 except for the addition of a few measures: zero-sum beliefs, perceived competition, and additional prejudice measures. After participants received feedback about the level of economic inequality in their geographic area, they then were asked to report their own opinions on a 6-item zero-sum beliefs measure (e.g.,

“Successes of some social groups are usually failures of other social groups”) on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*), ($\alpha = .95$; Różycka-Tran et al., 2015).

Next, participants were asked three items that assessed perceived intergroup competition using a scale from 1 (*not at all*) to 5 (*all the time*). These items were: “To what extent do you think different social groups in your geographic area...” 1) “...will compete with each other for financial resources?”, 2) “...will try to keep financial resources for their social group?”, and 3) “...will view each other as threats to their own financial resources?” ($\alpha = .86$).

Finally, we added some measures of prejudice to examine the nuances in the type of prejudice participants perceived towards different social groups. As in Study 1, we asked participants how much they think people in their geographic region would want specific outgroups as neighbors (i.e., desired social closeness). Additionally, we asked participants how much they think people in their geographic region would think people in different social groups are competent and warm, and how positive they think people in their geographic area would feel toward different social groups (0 = *not at all*; 100 = *extremely*). Similar to Study 1, the social groups of interest were: people in their social group, people of a different race, people of a different religion, people who speak a different language, immigrants/foreign workers, people of a different socioeconomic status.

Finally, participants reported additional demographic information, were debriefed, and compensated for their time.

Results

First, we investigated correlations between variables of interest (see Table 2). Next, we investigated whether economic inequality condition caused changes in: (1) zero-sum beliefs, (2) perceived competition, and (3) perceptions of prejudice. We predicted that participants in the

high (vs. low) economic inequality condition would report more zero-sum beliefs, more perceived competition, and would believe that individuals in their geographic region are more prejudiced. See Table 3 for means, standard deviations, and inferential statistic test values.

As anticipated, participants in the high (vs. low) inequality condition reported more zero-sum beliefs, $t(391.21) = -5.97, p < .001, 95\% \text{ CI } [-1.27, -0.64], d = 0.60$. In addition, participants in the high (vs. low) inequality condition perceived more competition between groups, $t(394.61) = -7.41, p < .001, 95\% \text{ CI } [-0.90, -0.52], d = 0.74$.

We measured prejudice using several different items: perceived competence, warmth, positivity, and desired social closeness toward their own social group and several outgroups (people of a different race, people of a different religion, people who speak a different language, immigrants/foreign workers, people of a different socioeconomic status). Similar to Study 1, we created two prejudice indexes by: 1) combining the ratings of all social outgroups ($\alpha_{\text{competent}} = .94; \alpha_{\text{warm}} = .95; \alpha_{\text{positive}} = .92; \alpha_{\text{social closeness}} = .94$), and 2) creating a difference score between ingroup and outgroups (i.e., the combined ratings of all social outgroups).⁵ When combining ratings toward all specific social outgroups, the results revealed that participants in the high (vs. low) economic inequality condition said those in their region would perceive outgroups as less competent, warm, positive, and wanting less social closeness with outgroups, $t_{\text{competent}}(391.78) = 3.23, p = .001, 95\% \text{ CI } [3.03, 12.45], t_{\text{warm}}(391.39) = 3.84, p < .001, 95\% \text{ CI } [4.36, 13.52], t_{\text{positive}}(393.95) = 3.08, p = .002, 95\% \text{ CI } [2.46, 11.14], t_{\text{social closeness}}(391.99) = 3.42, p < .001, 95\% \text{ CI } [3.76, 13.97]$. The effects were similar when using the difference score measure of prejudice. Participants in the high (vs. low) economic inequality condition perceived their

⁵ Given there are numerous different ways we could calculate prejudice, we present different ways to analyze these data in the Supplemental Materials. Of note, regardless of how prejudice is calculated, the substantive findings reported in this manuscript are similar to the substantive findings reported in the Supplemental Materials.

ingroup relative to outgroups as more competent, warmer, marginally more positive, and perceived those in their region to want more social closeness with their ingroup relative to outgroups, $t_{competent}(381.91) = -2.18, p = .03, 95\% \text{ CI } [-10.67, -0.55], t_{warm}(382.90) = -2.14, p = .03, 95\% \text{ CI } [-10.27, -0.44], t_{positive}(388.33) = -1.74, p = .08, 95\% \text{ CI } [-9.53, 0.57], t_{social\ closeness}(391.26) = -2.70, p = .007, 95\% \text{ CI } [-13.06, -2.05]$.

Table 2*Means, Standard Deviations, Reliability, and Correlations between Measures of Interest, Study 2.*

	2	3	4	5	6	7	8	9	10	11	12	M (SD)	α
Group-level competition	0.62***	-0.24***	0.11*	-0.24***	0.17***	-0.27***	0.15**	-0.24***	0.17***	0.00	-0.11*	3.22 (1.03)	.86
Zero-sum beliefs	-	-0.20***	0.12*	-0.15**	0.18***	-0.20***	0.15**	-0.18***	0.08	-0.06	-0.17***	3.70 (1.66)	.94
Positivity	-	-	-0.65***	0.85***	-0.51***	0.85***	0.48***	0.80***	-0.50***	0.14**	0.11*	57.06 (22.20)	.92
Positivity ingroup-outgroup difference	-	-	-	-0.62***	0.67***	-0.57***	0.66***	-0.58***	0.67***	-0.20***	-0.11*	21.64 (25.63)	NA
Competence	-	-	-	-	-0.59***	0.87***	-0.55***	0.83***	-0.57***	0.14***	0.08	56.12 (24.07)	.94
Competence ingroup-outgroup difference	-	-	-	-	-	-0.52***	0.75***	-0.56***	0.70***	-0.22***	-0.12*	24.24 (27.45)	NA
Warmth	-	-	-	-	-	-	-0.58***	0.85***	-0.53***	0.13*	0.10	58.46 (23.52)	.95

Warmth ingroup- outgroup difference	-	-	-	-	-	-	-	-0.53***	0.73***	-0.13**	-0.07	20.94 (26.17)	NA
Social closeness	-	-	-	-	-	-	-	-	-0.63***	0.09	0.06	57.10 (26.12)	.94
Social closeness ingroup- outgroup difference	-	-	-	-	-	-	-	-	-	-0.14**	-0.07	28.39 (29.11)	NA
Political orientation (social)	-	-	-	-	-	-	-	-	-	-	0.73***	3.45 (1.91)	NA
Political orientation (economic)	-	-	-	-	-	-	-	-	-	-	-	4.03 (1.91)	NA

Note: * indicates p -value < .05, ** indicates p -value < .01, and *** indicates p -value < .001.

Table 3*Means, Standard Deviations, and Inferential Statistics for Dependent Variables of Interest by Condition, Study 2*

DV	Inequality Condition				t-test	p-value	95% CI	Cohen's d
	Low		High					
	M	SD	M	SD				
Competition	2.86	0.92	3.57	1.01	-7.41	< .001	[-0.90, -0.52]	0.74
Zero-sum	3.22	1.50	4.17	1.68	-5.97	< .001	[-1.27, -0.64]	0.60
Difference Score (ingroup – outgroup)								
Competence	19.27	23.24	24.89	27.67	-2.18	.03	[-10.67, -0.55]	0.22
Warmth	15.87	22.68	21.23	26.76	-2.14	.03	[-10.27, -0.44]	0.22
Positivity	19.39	23.82	23.87	27.18	-1.74	.08	[-9.53, 0.57]	0.18
Social Closeness	23.29	27.03	30.84	28.53	-2.70	.007	[-13.06, -2.05]	0.27
Average of All Outgroups								
Competence	60.01	23.95	52.27	23.63	3.23	.001	[3.03, 12.45]	0.33
Warmth	62.95	23.46	54.01	22.79	3.84	<.001	[4.36, 13.52]	0.39
Positivity	60.47	21.73	53.67	22.21	3.08	.002	[2.46, 11.14]	0.31
Social Closeness	61.56	25.72	52.69	25.83	3.41	<.001	[3.76, 13.97]	0.34

Serial Mediation

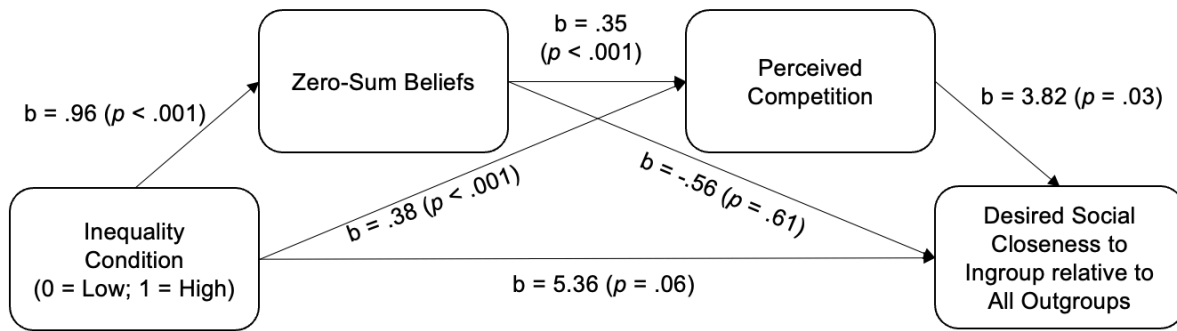
Finally, for exploratory purposes, we investigated a serial mediation pattern whereby economic inequality condition predicted zero-sum beliefs (M1), perceived competition (M2), and, in turn, prejudice (Y).⁶ Given that desired social closeness is the closest to a behavioral measure, we used desired social closeness as the primary measure of prejudice in these analyses.⁷ To test this pattern, we used lavaan with 10,000 bootstrapped resamples (Rosseel, 2012). Because there are two ways to calculate prejudice, we conducted these analyses twice: 1) desired social closeness toward all social outgroups, and 2) the difference score of desired social closeness between one's ingroup and all outgroups. See Figure 2 for indirect and specific pathway findings. Overall, the pattern of results suggests that greater levels of economic inequality in one's geographic region leads to perceptions of greater prejudice by way of increased zero-sum beliefs and perceived competition.

Figure 2

Serial Mediation Figures Predicting Desired Social Closeness Toward All Social Groups (Top) and the Difference Score Between Ingroup and Outgroups (Bottom), Study 2

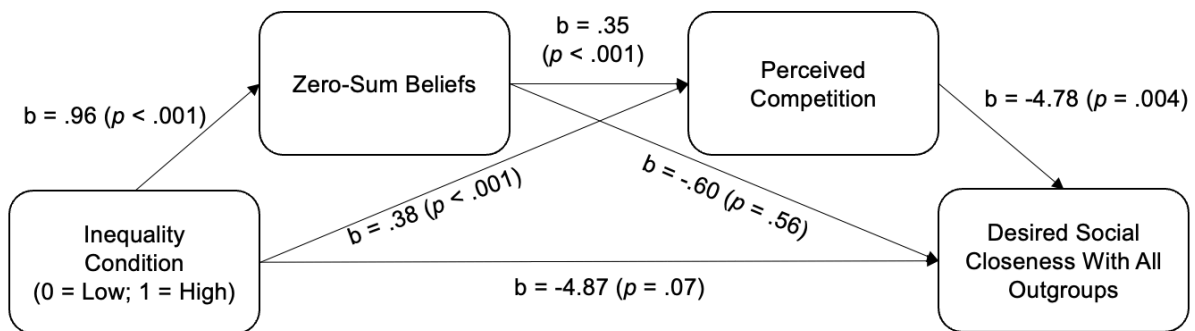
⁶ We also tested simple indirect effects through perceived competition (controlling for zero-sum beliefs) and through zero-sum beliefs (controlling for perceived competition) separately for our four measures of prejudice – perceived competence, warmth, positivity, and desired social closeness – we ran this model four times. For specific findings from these models, see the Supplemental Materials. Overall, the results revealed significant mediation via perceived competition across all measures of prejudice and non-significant mediation via zero-sum beliefs across all measures of prejudice.

⁷ For analyses using the other measures of prejudice, see the Supplemental Materials. Overall, the pattern of results is similar, but the other models do not reach traditional levels of statistical significance.



Indirect Effects:

Mediation Pattern	<i>b</i>	95% CI
Condition → Zero-Sum → Social Closeness	-0.54	[-2.63, 1.67]
Condition → Competition → Social Closeness	1.46	[.13, 3.24]
Condition → Zero-Sum → Competition → Social Closeness	1.28	[.12, 2.60]



Indirect Effects:

Mediation Pattern	<i>b</i>	95% CI
Condition → Zero-Sum → Social Closeness	-0.58	[-2.68, 1.37]
Condition → Competition → Social Closeness	-1.82	[-3.63, -.53]
Condition → Zero-Sum → Competition → Social Closeness	-1.83	[-3.71, -.49]

Note. Coefficient of path from inequality condition to desired social closeness represents direct effect.

Discussion

Study 2 replicated and extended the findings in Study 1. We found that greater perceived inequality in one's own region resulted in greater zero-sum beliefs, greater competition, and, in turn, greater prejudice towards outgroups. Overall, these results lend evidence to our hypotheses.

Next, we explore whether the findings in Study 2 extend to a specific case: the relationship between economic inequality and racial/ethnic prejudice among a racially/ethnically diverse sample of participants.

Study 3

Study 3 sought to extend the previous studies to understand whether higher economic inequality exacerbates racial/ethnic prejudice. Racial/ethnic prejudice represents a unique and important situation in which to test our model as race/ethnicity is integrally linked with social status in the U.S. (e.g., Moller et al., 2009; Bobo & Hutchins, 1996). Further, past research suggests that White Americans may be particularly likely to express prejudice toward minoritized groups to maintain their power and the status quo (e.g., Sidanius & Pratto, 2001). Additionally, intergroup prejudice may emerge between minoritized groups (e.g., Black and Latinx Americans) to the extent that people of these groups feel they are competing against one another for resources (Bobo & Hutchins, 1996). Together, this would suggest that high economic inequality may lead to greater intergroup prejudice for all racial/ethnic groups, but this may be particularly true for White Americans. We investigate these possibilities using a large, diverse sample of American residents. For exploratory purposes, we also investigate whether economic inequality affects willingness to coalition build across racial groups.

Method

Statistical Power and Participants

An *a priori* power analysis indicated that for a two-condition between-subjects design, we would need a total sample size of $N = 352$ to detect a small-to-medium effect size (Cohen's $d = .30$) with adequate power ($1 - \beta = .80$; G*Power; Faul et al., 2009). However, because we were interested in effects separately based on the racial/ethnic identity of the participant, we aimed to recruit 1600 participants from prolific to have sufficient power to investigate subgroup analyses with 400 participants in each of the following racial/ethnic groups: Asian, Black or African American, Latinx or Hispanic, and White. After removing data from individuals who failed a robot check, attention checks or manipulation checks, 1575 participants remained who were on average 33.66 years old. We aimed to recruit an equal number of White (27.43%), Black (25.02%), Asian (25.02%), and Latinx (22.54%) participants. The majority of participants were female (63.75%, 34.48% male, and 1.78% other) and participants' ages ranged from 18 to 92 years ($M = 33.66$, $SD = 12.91$).

Procedure

The manipulation for Study 3 was the same as Studies 1 and 2. After participants received feedback about the level of economic inequality in their geographic area, they then completed a 3-item zero-sum beliefs measure (e.g., "If one group of people gets richer, it means that other groups of people get poorer.") on a scale from 1 (*strongly disagree*) to 6 (*strongly agree*), ($\alpha = .86$; Różycka-Tran et al., 2015). Next, participants were asked two items that assessed perceived intergroup competition using a scale from 1 (*strongly disagree*) to 6 (*strongly agree*). These items were: "People in my area compete with each other for financial resources" and "My area is very competitive in terms of earning financial resources", ($\alpha = .84$). Different from Study 2, we assessed prejudice just by assessing desired social closeness with different racial/ethnic groups. Specifically, for each racial/ethnic group, we asked the following two

questions “How comfortable do you think most [insert participants’ racial group] people would be in these situations?” 1) “In a social setting (such as a club or bar) where most people are [Asian/Black/Latinx/White] and 2) “Marrying an [Asian/Black/Latinx/White] person.” Participants responded on a scale from 1 (*not at all comfortable*) to 10 (*extremely comfortable*), and answered these items about all racial groups except their own ($\alpha_{\text{Asian}} = .83$, $\alpha_{\text{Black}} = .84$, $\alpha_{\text{Latinx}} = .82$, $\alpha_{\text{White}} = .78$).

Next, participants reported their desire to build a coalition with other racial/ethnic groups – a measure unique to this study. We measured willingness to coalition build by asking “To what extent do you think most [insert participants’ racial group] people...” 1) “feel their ideas, interests, and feelings are close to the ideas, interests, and feelings of [Asian/Black/Latinx/White] people?” and 2) “feel they can form a strategic partnership with [Asian/Black/Latinx/White] people? This was on a scale from 1 (*not at all*) to 5 (*extremely*; $\alpha_{\text{Asian}} = .84$, $\alpha_{\text{Black}} = .86$, $\alpha_{\text{Latinx}} = .84$, $\alpha_{\text{White}} = .82$). Again, participants answered about coalition building with all other racial groups except their own. Finally, participants reported additional demographic information, were debriefed, and compensated for their participation.

Results

First, we investigated correlations between variables of interest (see Table 4). Next, we investigated whether the economic inequality condition caused changes in zero-sum beliefs and perceived competition (see Table 5 for means, standard deviations, and inferential statistics). As expected, participants in the high (vs. low) inequality condition reported more zero-sum beliefs and perceived more competition, $t_{\text{zero-sum}}(1568.6) = -4.33$, $p < .001$, 95% CI [-0.41, -0.15], $d = -0.22$, $t_{\text{competition}}(1570.1) = -12.48$, $p < .001$, 95% CI [-0.92, -0.67], $d = -0.63$. We also investigated these findings separately based on participants’ racial/ethnic self-identification. We found a

similar pattern of results emerge for White participants, Asian participants, and Black participants – participants in the high (vs. low) inequality condition reported more zero-sum beliefs and perceived more competition. Latinx participants perceived greater competition in the high (vs. low) inequality condition but showed no difference in zero-sum beliefs.

Table 4*Means, Standard Deviations, Reliability, and Correlations between Measures of Interest, Study 3.*

	ZeroSum	Compete	Desire to be close to				Desire to coalition build with		
			Asian	Black	Latinx	White	Asian	Black	Latinx
Compete	.361***	--							
AsianClose	-.097***	-.087**	--						
BlackClose	-.086**	-.067*	.633***	--					
LatinxClose	-.089**	-0.041	.589***	.774***	--				
WhiteClose	-.157***	-.080**	.467***	.228***	.191***	--			
AsianCoalition	-.059*	-0.026	.547***	.318***	.208***	.216***	--		
BlackCoalition	-0.046	-0.015	.375***	.650***	.473***	-0.007	.470***	--	
LatinxCoalition	-.087**	0.015	.342***	.455***	.571***	0.022	.410***	.633***	--
WhiteCoalition	-.112***	-0.026	.167***	-0.035	-.080*	.580***	.338***	-0.033	0.069

*** Correlation is significant at the 0.001 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 5*Means, Standard Deviations, and Inferential Statistics for Dependent Variables of Interest by Condition, Study 3*

Participant group	DV	Low inequality		High inequality		<i>t</i>	df	<i>p</i>	95% CI		Cohen's <i>d</i>
		Mean	SD	Mean	SD						
All	ZeroSum	3.96	1.33	4.24	1.26	-4.33	1568.6	<.001	-0.41	-0.15	-0.22
	Compete	3.36	1.29	4.16	1.24	-12.48	1570.1	<.001	-0.92	-0.67	-0.63
Asian	ZeroSum	3.99	1.27	4.34	1.09	-2.93	385.07	0.004	-0.58	-0.12	-0.30
	Compete	3.31	1.20	4.24	1.12	-7.90	391.21	<.001	-1.15	-0.69	-0.80
Black	ZeroSum	4.00	1.33	4.28	1.28	-2.12	392.99	0.034	-0.54	-0.02	-0.21
	Compete	3.42	1.35	4.10	1.32	-5.04	391.69	<.001	-0.94	-0.41	-0.51
Latinx	ZeroSum	4.15	1.41	4.32	1.25	-1.22	334.86	0.224	-0.45	0.11	-0.13
	Compete	3.31	1.25	4.26	1.24	-7.13	357.4	<.001	-1.20	-0.68	-0.76
White	ZeroSum	3.73	1.33	4.03	1.28	-2.28	423.29	0.023	-0.55	-0.04	-0.22
	Compete	3.38	1.33	4.04	1.28	-5.25	428.91	<.001	-0.91	-0.41	-0.51

Next, we examined the relationship between condition and one's desired closeness to outgroup members (see Table 6 for means, standard deviations, and inferential statistics).

Overall, participants perceived that those in their region would desire less closeness to Asian and Latinx Americans when inequality was high (vs. low), $t_{close\ Asian}(1173.7) = 2.04, p = .042, 95\% CI [0.01, 0.51], d = 0.12, t_{close\ Latinx}(1152.7) = 2.54, p = .011, 95\% CI [0.07, 0.54], d = 0.15$. No other statistically significant findings emerged. We also investigated these findings separately based on participants' racial/ethnic self-identification. When inequality was high (vs. low), Black participants perceived less desired closeness with Latinx people, $t_{close\ Black.Latinx}(386.63) = 1.99, p = .047, 95\% CI [0.01, 0.80], d = 0.20$. Latinx participants also perceived less desired closeness with Black people when inequality was high (vs. low), $t_{close\ Latinx.Black}(337.22) = 2.10, p = .037, 95\% CI [0.03, 1.03], d = 0.22$. White participants perceived less desired closeness to all other racial/ethnic groups when inequality was high (vs. low), $t_{close\ White.Asian}(427) = 2.17, p = .031, 95\% CI [0.04, 0.80], d = 0.21; t_{close\ White.Black}(425.09) = 3.07, p = .002, 95\% CI [0.24, 1.08], d = 0.30; t_{close\ White.Latinx}(427.96) = 2.64, p = .009, 95\% CI [0.13, 0.90], d = 0.25$. Contrary to expectations, Asians desired more closeness with Black people when inequality was high (vs. low), $t_{close\ Asian.Black}(391) = -2.20, p = .029, 95\% CI [-0.81, -0.04], d = -0.22$.

Table 6*Means, Standard Deviations, and Inferential Statistics for Dependent Variables of Interest by Condition, Study 3*

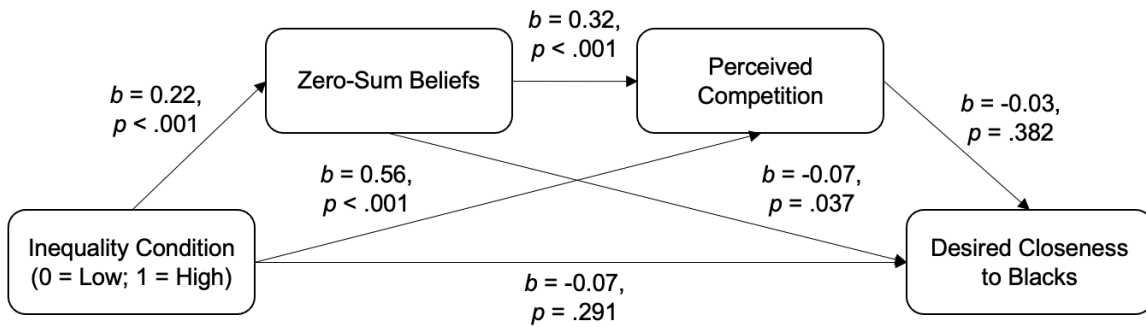
<i>Participant group</i>	<i>Desired closeness to...</i>	Low inequality		High inequality		<i>t</i>	df	<i>p</i>	95% CI	Cohen's <i>d</i>	
		Mean	SD	Mean	SD						
All											
	Asian	6.13	2.22	5.88	2.14	2.04	1173.7	0.042	0.01	0.51	0.12
	Black	5.08	2.45	4.85	2.14	1.69	1152.7	0.091	-0.04	0.49	0.10
	Latinx	6.23	2.13	5.93	2.06	2.54	1215.8	0.011	0.07	0.54	0.15
	White	5.93	2.20	5.97	2.06	-0.36	1132.2	0.721	-0.29	0.20	-0.02
Asian											
	Black	3.87	1.95	4.30	1.91	-2.20	391	0.029	-0.81	-0.04	-0.22
	Latinx	5.24	1.82	5.29	1.89	-0.27	389.59	0.790	-0.42	0.32	-0.03
	White	6.54	1.90	6.57	1.75	-0.17	389.8	0.862	-0.39	0.33	-0.02
Black											
	Asian	5.54	2.32	5.36	2.29	0.74	390.58	0.457	-0.28	0.63	0.08
	Latinx	7.20	1.94	6.80	2.08	1.99	386.63	0.047	0.005	0.80	0.20
	White	5.06	2.20	5.13	2.04	-0.34	390.65	0.732	-0.49	0.35	-0.03
Latinx											
	Asian	6.29	2.21	6.10	2.05	0.82	340.88	0.413	-0.26	0.63	0.09
	Black	6.08	2.51	5.54	2.25	2.10	337.217	0.037	0.03	1.03	0.22
	White	6.24	2.23	6.22	2.12	0.11	344.3	0.910	-0.43	0.48	0.01
White											
	Asian	6.56	2.01	6.14	2.01	2.17	427	0.031	0.04	0.80	0.21
	Black	5.40	2.36	4.75	2.07	3.07	425.09	0.002	0.24	1.08	0.30
	Latinx	6.25	2.14	5.73	1.93	2.64	427.96	0.009	0.13	0.90	0.25

Serial mediation

For exploratory purposes, we investigated a serial mediation pattern whereby economic inequality condition predicted zero-sum beliefs (M1), perceived competition (M2), and, in turn, desired closeness to Asians/ Blacks/ Latinx/ and Whites (Y).⁸ To test this pattern, we used lavaan with 10,000 bootstrapped resamples (Rosseel, 2012). Continuous variables were standardized prior to analyses. Although the pattern of effects was similar to Study 2, the serial indirect pathway was not significant when predicting desired closeness toward Asian, Black, Latinx, or White Americans (see Figure 3). However, this serial mediation pattern also simultaneously investigates simple mediation via zero-sum beliefs and perceived competition, and these results reveal significant simple mediation via perceived zero-sum beliefs. This suggests that high (vs. low) economic inequality increased perceived zero-sum beliefs which, in turn, increased participants' perception that their racial/ethnic group would be less willing to be close to Asian, Black, Latinx, or White Americans.

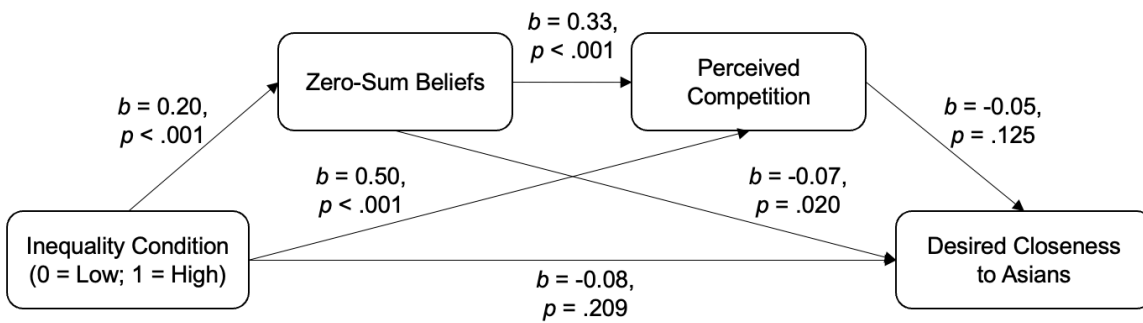
Figure 3

⁸ We test other exploratory mediation patterns in the Supplemental Materials.



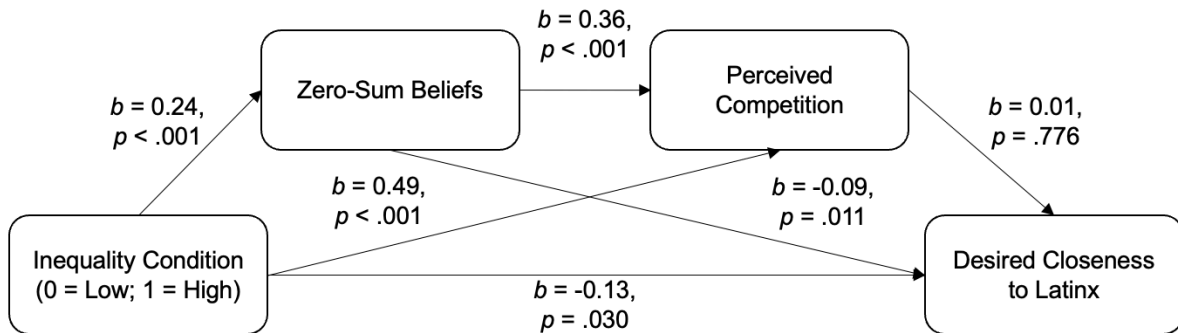
Indirect Effects

Mediation Pattern	B	95% CI
Condition → Zero-Sum → Social Closeness	-0.02	[-0.04, -0.001]
Condition → Competition → Social Closeness	-0.02	[-0.06, 0.02]
Condition → Zero-Sum → Competition → Social Closeness	-0.002	[-0.01, 0.003]



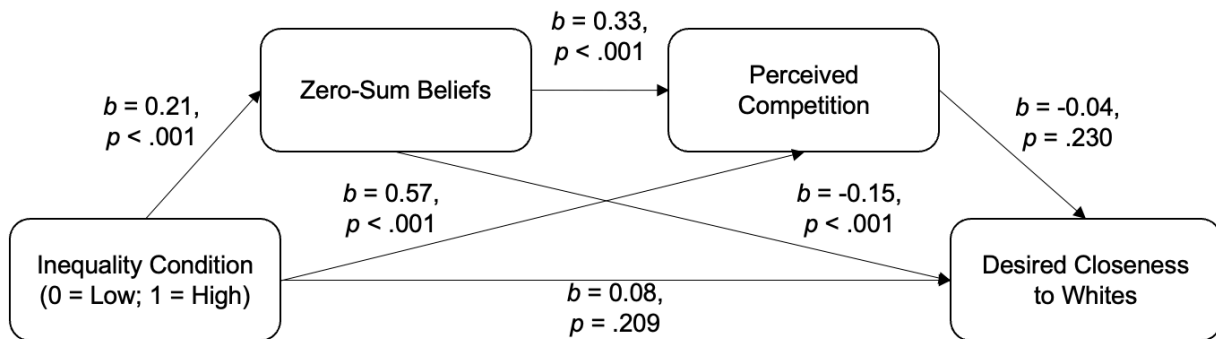
Indirect Effects

Mediation Pattern	B	95% CI
Condition → Zero-Sum → Social Closeness	-0.02	[-0.03, -0.002]
Condition → Competition → Social Closeness	-0.03	[-0.06, 0.01]
Condition → Zero-Sum → Competition → Social Closeness	-0.003	[-0.01, 0.001]



Indirect Effects

Mediation Pattern	B	95% CI
Condition → Zero-Sum → Social Closeness	-0.02	[-0.04, -0.004]
Condition → Competition → Social Closeness	-0.01	[-0.03, 0.04]
Condition → Zero-Sum → Competition → Social Closeness	0.001	[-0.01, 0.01]



Indirect Effects

Mediation Pattern	B	95% CI
Condition → Zero-Sum → Social Closeness	-0.03	[-0.06, -0.01]
Condition → Competition → Social Closeness	-0.02	[-0.06, 0.02]
Condition → Zero-Sum → Competition → Social Closeness	-0.003	[-0.01, 0.002]

We also investigated this serial mediation pattern separately based on participants' racial/ethnic self-identification (for detailed findings, see Supplemental Materials). Again, we did not find evidence for a serial indirect effect. However, this serial mediation pattern also

simultaneously investigates simple mediation via zero-sum beliefs and perceived competition. For Black participants, there was a significant simple mediation between inequality and closeness with White people via perceived zero-sum beliefs, suggesting that high (vs. low) inequality increased zero-sum beliefs and, in turn, led to less desired closeness with White people, indirect effect $b = -.04$, 95% CI $[-.10, -.002]$. For White participants, there was also significant simple mediation between inequality and closeness with Black people via perceived zero-sum beliefs. This pattern suggests that high (vs. low) inequality increased zero-sum beliefs and, in turn, led to less desired closeness with Black people, indirect effect $b = -.04$, 95% CI $[-.09, -.002]$. For Latinx participants, there was a significant simple mediation between inequality and closeness with Asians and Blacks via perceived competition. In both cases, this pattern suggests that high (vs. low) inequality increased perceived competition and, in turn, led to less desired closeness with Asian and Black people, indirect effect $b_{Asian} = -.08$, 95% CI $[-.17, -.01]$, indirect effect $b_{Black} = -.09$, 95% CI $[-.19, -.002]$. No other findings yielded statistically significant indirect effects. Taken together, these findings suggest that, overall, zero-sum beliefs may be a particularly potent mechanism to consider when trying to understand the relationship between economic inequality and racial/ethnic prejudice. But the mechanism may vary by racial group.

Finally, and unique to this study, we next examined the relationship between the inequality condition and willingness to coalition build with other racial/ethnic groups (see Table 7 for means, standard deviations, and inferential statistics). Overall, participants perceived that those in their region would be less willing to coalition build with Asian and Latinx Americans when inequality was high (vs. low), $t_{Asian}(1170.1) = 2.01$, $p = .045$, 95% CI $[0.002, 0.22]$, $d = 0.12$; $t_{Latinx}(1213.9) = 2.62$, $p = .009$, 95% CI $[0.03, 0.22]$, $d = 0.15$. No other statistically

significant differences emerged. We also investigated these findings separately based on participants' racial/ethnic self-identification. Results revealed that Black participants perceived their racial group would be less willing to coalition build with Latinx Americans when inequality is high (vs. low), $t_{Black.Latinx}(388.5) = 2.88, p = .004, 95\% \text{ CI } [0.07, 0.40], d = 0.29$. White participants perceived their racial group would be less willing to coalition build with Asian and Black racial groups when in the high (vs. low) inequality condition, $t_{White.Asian}(426.15) = 2.08, p = .038, 95\% \text{ CI } [0.01, 0.33], d = 0.20$; $t_{White.Black}(424.11) = 2.33, p = 0.020, 95\% \text{ CI } [0.03, 0.36], d = 0.22$. No other statistically significant findings emerged.

Table 7*Means, Standard Deviations, and Inferential Statistics for Dependent Variables of Interest by Condition, Study 3*

<i>Participant group</i>	<i>Build coalition with...</i>	Low inequality		High inequality		<i>t</i>	<i>df</i>	<i>p</i>	95% CI		Cohen's <i>d</i>
		Mean	SD	Mean	SD						
All											
	Asian	2.81	0.97	2.70	0.92	2.01	1170.1	0.045	0.002	0.22	0.12
	Black	2.69	0.96	2.64	0.86	0.88	1161.5	0.379	-0.06	0.15	0.05
	Latinx	3.00	0.85	2.87	0.81	2.62	1213.9	0.009	0.03	0.22	0.15
	White	2.69	1.00	2.66	0.96	0.51	1135	0.613	-0.08	0.14	0.03
Asian											
	Black	2.26	0.83	2.37	0.81	-1.36	390.98	0.175	-0.27	0.05	-0.14
	Latinx	2.72	0.82	2.72	0.78	0.03	390.72	0.9793	-0.16	0.16	-0.003
	White	3.13	0.95	3.04	0.83	0.94	386.78	0.348	-0.09	0.26	-0.09
Black											
	Asian	2.46	0.95	2.29	0.87	1.80	390.4	0.072	-0.01	0.35	0.18
	Latinx	3.30	0.80	3.06	0.83	2.88	388.5	0.004	0.07	0.40	0.29
	White	2.25	0.88	2.23	0.88	0.19	390.26	0.847	-0.16	0.19	0.02
Latinx											
	Asian	2.68	0.90	2.71	0.90	-0.32	348.5	0.748	-0.22	0.16	0.03
	Black	2.99	0.97	2.91	0.89	0.77	340.14	0.440	-0.12	0.27	0.08
	White	2.71	0.98	2.72	0.98	-0.03	348.94	0.974	-0.21	0.20	0.004
White											
	Asian	3.23	0.88	3.06	0.81	2.08	426.15	0.038	0.01	0.33	0.20
	Black	2.85	0.93	2.65	0.81	2.33	424.11	0.020	0.03	0.36	0.22
	Latinx	2.98	0.84	2.85	0.79	1.68	427.95	0.094	-0.02	0.29	0.16

Discussion

Study 3 sought to extend the hypothesized model to a specific case: racial/ethnic prejudice. Past research suggests that White Americans may be particularly likely to express prejudice toward minoritized groups to maintain their power and the status quo (e.g., Sidanius & Pratto, 2001). Additionally, intergroup prejudice may emerge between minoritized groups (e.g., Black and Latinx Americans) to the extent that people of these groups feel they are competing against one another for resources (Bobo & Hutchins, 1996). The current findings lend evidence to both possibilities. There is some evidence of intergroup prejudice among minoritized groups, and there is evidence of White people expressing prejudice toward all racial outgroups. The process which gives rise to prejudice, however, is more nuanced when considering racial/ethnic prejudice. Namely, instead of finding consistent evidence for serial mediation via zero-sum beliefs and perceived competition, for Asian, Black, and White participants, there appears to be more evidence for simple mediation via zero-sum beliefs. However, for Latinx participants, there appears to be simple mediation via perceived competition. Although we are unsure why we may see different patterns depending on racial/ethnic group, we suggest some possible explanations and routes for future research in the General Discussion. Overall, however, the findings suggest that higher economic inequality exacerbates racial/ethnic prejudice, and that this may be a result of a combination of zero-sum beliefs and perceived competition. Critically, however, these findings suggest that the overall proposed model may broadly explain the relationship between economic inequality and intergroup prejudice, yet we should anticipate important nuance to this model when drilling down to specific prejudices and racial groups.

Study 4

In a final study, we sought to mitigate perceived prejudice by reducing intergroup competition and zero-sum beliefs. Here, we return to the dependent measures used in Studies 1 and 2 and investigate prejudice toward a wide range of social identities: people of a different race, people of a different religion, people who speak a different language, immigrants/foreign workers, and people of a different socioeconomic status. Although Study 3 revealed unique patterns when investigating racial/ethnic prejudice, overall, the findings from both Studies 2 and 3 suggest that both zero-sum beliefs and perceived competition may be particularly important when investigating why economic inequality may exacerbate prejudice. Therefore, we created a manipulation which assuaged or exacerbated zero-sum beliefs and competition in the final study.

Method

Statistical Power and Participants

An *a priori* power analysis revealed that in order to detect a small-to-medium effect size ($d = .30$) with adequate power ($1-\beta=.80$) for a two-tailed t-test we needed a total sample size of 352. We sought to collect 400 participants from Amazon Mechanical Turk using CloudResearch. After removing data from individuals who failed the robot check, attention checks and manipulation checks, 368 participants remained who were on average 38.88 years old. The majority of participants identified as White (76.09%, 6.52% Black, 7.88% Asian, 0.27% Native American, 2.17% multiracial, and 0.27% other) and female (63.59%, 35.87% male, and 0.54% other).

Procedure

Participants went through a similar procedure as the economic inequality manipulation in Studies 1, 2 and 3. However, this time they were told the computer was calculating their “geographic economic competitiveness index” instead of an inequality score. Unbeknownst to

participants, they were randomly assigned to either the high or low competition condition. In the high competition condition, participants read that “Based on the economic competitiveness index, you live in a VERY economically competitive place. Because there is a limited amount of economic resources in your area, people are fiercely competing against each other for these resources. Therefore, when people move up in economic status it is often at the expense of others. Put simply, when people get richer, others get poorer.” In the low competition condition, participants read “Based on the economic competitiveness index, you DO NOT live in a very economically competitive place. Because there is an unlimited amount of economic resources in your area, there is no competition between people in your area and everyone has an opportunity to earn as many resources as they desire. Therefore, when people move up in economic status it has NO effect on others’ outcomes. Put simply, when people get richer, it doesn't mean that others get poorer.” As a manipulation check, we asked participants one item to assess perceived zero-sum beliefs (“If one social group gets richer it means that another social group gets poorer”) on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) and one item to assess perceived competition (“To what extent do you think different social groups in your geographic area will compete with each other for financial resources?”) on a scale from 1 (*not at all*) to 5 (*all of the time*).

Participants completed the same prejudice measures as in Study 2. Finally, participants reported demographic information, were debriefed, and compensated for their participation.

Results

We first investigated correlations between variables of interest (see Table 8).

Manipulation Check

To examine whether our manipulation was effective, we examined participants' perception of intergroup competition and zero-sum beliefs. See Table 9 for means, standard deviations, and inferential statistics. Participants in the high (vs low) competition condition perceived more competition between groups and reported more zero-sum beliefs, $t_{competition}(327) = -19.98, p < .001, CI [-2.18, -1.79], d = 2.11$; $t_{zero-sum}(359.67) = -16.80, p < .001, CI [-3.23, -2.55], d = 1.77$. These findings suggest the manipulation was successful.

Prejudice

Next, we investigated whether reducing perceived competition mitigated perceptions of prejudice. Identical to Study 4, we measured prejudice using a few different items: perceived competence, warmth, positivity, and desired social closeness toward their own social group and several outgroups (people of a different race, people of a different religion, people who speak a different language, immigrants/foreign workers, people of a different socioeconomic status). Again, for analyses we created two social closeness indexes by: 1) combining the ratings of all specific social outgroups ($\alpha_{competent} = .92$; $\alpha_{warm} = .93$; $\alpha_{positive} = .88$; $\alpha_{social\ closeness} = .92$), and 2) creating a difference score between people in one's social group and people who are not in one's social group. See Table 10 for means, standard deviations, and inferential statistic test values.

When combining ratings toward all specific social outgroups, the results revealed that participants in the low (vs. high) competition condition perceived outgroups as more competent, warm, positive, and perceived their ingroup to want to be socially closer to outgroups, $t_{competent}(359.57) = 3.59, p < .001, 95\% CI [3.88, 13.28], d = 0.38$; $t_{warm}(360.58) = 2.96, p = .003, 95\% CI [2.32, 11.49], d = 0.31$; $t_{positive}(357.42) = 3.85, p < .001, 95\% CI [4.21, 13.03], d = 0.40$; $t_{social\ closeness}(358.81) = 3.32, p < .001, 95\% CI [3.59, 14.05], d = 0.35$. The effects were similar when using the difference score. Participants in the low (vs. high) competition condition

perceived their ingroup relative to outgroups as more competent, warmer, marginally more positive, and perceived the relative social closeness difference to the ingroup vs. outgroup was smaller, $t_{competent}(360.81) = -2.50, p = .013, 95\% \text{ CI } [-11.17, -1.33], d = 0.26$; $t_{warm}(360.43) = -2.59, p = .01, 95\% \text{ CI } [-11.40, -1.55], d = 0.27$; $t_{positive}(360.97) = -2.69, p = .007, 95\% \text{ CI } [-11.75, -1.83], d = 0.28$; $t_{social \ closeness}(360.65) = -2.70, p = .007, 95\% \text{ CI } [-13.50, -2.11], d = 0.28$.

Table 8*Means, Standard Deviations, Reliability, and Correlations between Measures of Interest, Study 4.*

	2	3	4	5	6	7	8	9	10	M (SD)	α
Positivity	-0.71***	0.82***	-0.60***	0.80***	-0.58***	0.74***	-0.61***	0.18**	0.22***	53.02 (21.72)	.88
Positivity ingroup- outgroup difference	-	-0.59***	0.72***	-0.55***	0.63***	-0.51***	0.62***	-0.14*	-0.13*	29.31 (24.25)	NA
Competence	-	-	-0.75***	0.87***	-0.64***	0.80***	-0.68***	0.14*	0.20***	52.01 (23.13)	.92
Competence ingroup- outgroup difference	-	-	-	-0.62***	0.77***	-0.60***	0.73***	-0.18**	-0.14*	28.44 (24.02)	NA
Warmth	-	-	-	-	-0.71***	0.82***	-0.66***	0.14*	0.21***	55.83 (22.45)	.93
Warmth ingroup- outgroup difference	-	-	-	-	-	-0.60***	0.74***	-0.18**	-0.18**	24.01 (24.07)	NA
Social closeness	-	-	-	-	-	-	-0.83***	0.10*	0.16*	54.24 (25.65)	.92

Social closeness ingroup- outgroup difference	-	-	-	-	-	-	-	-0.15*	-0.15*	32.83 (27.79)	NA
Political orientation (social)	-	-	-	-	-	-	-	-	0.82***	3.36 (1.89)	NA
Political orientation (economic)	-	-	-	-	-	-	-	-	-	3.85 (1.81)	NA

Table 9*Means, Standard Deviations, and Inferential Statistics for Manipulation Check by Condition, Study 4*

DV	Perceived Competition Condition				<i>t</i> -test	<i>p</i> -value	95% <i>CI</i>	<i>Cohen's d</i>
	Low		High					
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Competition	2.12	1.07	4.10	0.80	-19.98	< .001	[-2.18, -1.79]	2.11
Zero-sum	2.30	1.66	5.19	1.62	-16.80	< .001	[-3.23, -2.56]	1.77

Table 10*Means, Standard Deviations, and Inferential Statistics for Dependent Variables of Interest by Condition, Study 4*

DV	Perceived Competition Condition		<i>M</i>	<i>SD</i>	<i>t</i> -test	<i>p</i> -value	95% CI	Cohen's <i>d</i>
	Low	High						
Average of all outgroups								
Competence	56.38	23.04	47.80	22.49	3.59	<.001	[3.88, 13.28]	0.38
Warmth	59.35	22.17	52.45	22.26	2.96	.003	[2.32, 11.49]	0.31
Positivity	57.41	21.97	48.79	20.66	3.85	<.001	[4.21, 13.03]	0.40
Social Closeness	58.74	25.81	49.92	24.81	3.32	<.001	[3.68, 14.08]	0.35
Difference score (ingroup – outgroup)								
Competence	25.25	23.09	31.50	24.56	-2.50	.01	[-11.17, -1.33]	0.26
Warmth	20.71	22.92	27.19	24.79	-2.59	.01	[-11.40, -1.55]	0.27
Positivity	25.84	23.46	32.64	24.60	-2.69	.01	[-11.75, -1.83]	0.28
Social Closeness	28.86	28.12	36.66	26.99	-2.70	.01	[-13.50, -2.11]	0.28

Discussion

In sum, Study 4 showed that reducing competition and zero-sum economics in one's geographic region in turn reduced prejudice towards outgroups. This supports the notion that competition and zero-sum beliefs are integral components to increased prejudice.

General Discussion

The current work investigated whether higher economic inequality exacerbates prejudice. In Study 1, we investigated the causal relationship between inequality and prejudice across numerous social groups and found evidence to support part of our hypothesis. Participants in the high (vs. low) inequality condition perceived people in their region to be more prejudiced against people of a different race, people of a different religion, people who speak a different language, immigrants/foreign workers, and people of a different socioeconomic status. Next, we investigated a potential mechanism: whether higher economic inequality triggered zero-sum beliefs and perceived competition which, in turn, lead to increased intergroup prejudice. In Study 2 we found that participants in the high (vs. low) inequality condition report greater perceived prejudice by way of increased zero-sum beliefs and competition between social groups.

Although these first two studies lend evidence to our hypotheses, we anticipated that when we consider a specific domain of prejudice, there would likely be nuanced findings. To investigate this possibility, we tested this model when considering racial/ethnic prejudice among a racially/ethnically diverse sample in Study 3. Consistent with the first two studies, we again found that higher economic inequality exacerbates racial/ethnic prejudice. However, we did find nuance such that when considering all participants, economic inequality only exacerbated prejudice toward Asian and Latinx individuals. We also examined prejudice separately by participants' racial/ethnic category and found an interesting pattern. When inequality was high

(vs. low) Black participants perceive more prejudice toward Latinx people, and the reverse was also true – Latinx participants perceived more prejudice toward Black people. Interestingly, White participants perceived more prejudice toward all racial outgroups when inequality was high (vs. low). These findings fit with prior research which suggests that White Americans may be particularly likely to express prejudice toward minoritized groups to maintain their power and the status quo (e.g., Sidanius & Pratto, 2001) and that intergroup prejudice may emerge between minoritized groups to the extent that people of these groups feel they are competing against one another for resources (Bobo & Hutchins, 1996).

Study 3 also provided further nuance with respect to the hypothesized mechanism: zero-sum and perceived competition. Interestingly, when considering the whole sample, the mediation occurred primarily through zero-sum beliefs, not perceived competition. This is important to consider when thinking through possible interventions as it highlights how perceptions that there are “winners” and “losers” may be critical, as opposed to just general competition for resources. Critically, we find further nuance in the mechanism depending on racial/ethnic group of the participant. Specifically, for Black and White participants, zero-sum beliefs mediated the relationship between economic inequality and prejudice. For Latinx participants, perceived competition mediated the relationship between economic inequality and prejudice. And we find no significant mediation for Asian participants. We are not sure why we see no significant mediation patterns for Asian Americans. Future research is needed to understand whether there is a mechanism we are simply overlooking for this group. Although zero-sum beliefs and perceived competition are conceptually similar, these findings suggest that zero-sum beliefs may be particularly important for Black and White Americans when considering the relationship between economic inequality and prejudice, but perceived competition may be particularly

important for Latinx Americans. Although we are unsure why these differences emerge between racial/ethnic groups of participants, we think it may be important to consider the history in the US. See limitations and future directions for further explanation.

Lastly, we investigated whether manipulating zero-sum beliefs and perceived competition may have mitigated the relationship between inequality and prejudice. We found that when competition and zero-sum beliefs are perceived to be lower, participants reported less perceived intergroup prejudice. This study provides important information regarding the psychological mechanism which may underlie the causal relationship between economic inequality and prejudice.

This current work fits within the broader research context, with prior work showing that economic inequality may exacerbate zero-sum beliefs (e.g., Davidai, 2022) and that economic inequality is associated with increased prejudice (e.g., Connor et al., 2019). Further, realistic group conflict theory contends that competition for limited resources may, in part, explain prejudice and hostility between groups (Campbell, 1965). That is, people compete for resources for themselves and for their group. If people believe that resources are limited (i.e., one group gaining resources means they are taking those resources away from them and their own group), groups may become hostile toward one another.

The current work extends beyond this previous research in three keyways. First, while prior work lends evidence to pieces of our model, most is correlational, and research has yet to experimentally test the full model. Second, past research has focused heavily on prejudice between racial groups (particularly anti-Black attitudes among White Americans). While we do examine race/ethnicity to understand the nuance of this model in a particular domain, the current work extends beyond White-on-Black prejudice to examine racial/ethnic prejudice toward

numerous racial ethnic groups and from a racially/ethnically diverse sample. Further, in Studies 1 and 2 we also examine how inequality affects prejudice towards a wide range of social groups. Therefore, this work allows us to simultaneously examine specific patterns as well zoom out and look at the theory more broadly. Third, not only does this work investigate the process by which inequality leads to prejudice, but it also aims to find ways to mitigate that prejudice. Our finding that reducing perceived intergroup competition in turn reduces intergroup prejudice can provide insight into larger scale interventions that we hope can ultimately reduce prejudice in the real world.

Limitations and Future Directions

A limitation of the current work is that we asked participants how *others* in their geographic region or social group would feel towards outgroups instead of asking about the participants' own feelings. We asked in this way because previous research has shown that people regulate their expression of personally endorsed prejudice, whereas prejudice framed in terms of cultural knowledge produces more candid reports (e.g., Fiske et al., 2002). Further, past research has found that measures framed as group- (vs. personal-) endorsement were more strongly associated with implicit bias and acting on stereotypes (e.g., Correll et al., 2002; Devine, 1989).

Another limitation of this work is that in Study 3 we found evidence for different mediational patterns than Study 2. In Study 2, we found evidence for sequential mediation via zero-sum beliefs and perceived competition when investigating the indirect pathway from inequality condition to prejudice. In Study 3, we investigated specific prejudice toward racial/ethnic groups. When considering the whole sample, we found evidence for simple mediation via zero-sum beliefs, but no evidence for the sequential mediation or for simple

mediation via perceived competition. For exploratory purposes, we investigated several other mediation patterns in the Supplemental Materials. That said, it may be that our hypothesized sequential model does not best capture the process when considering racial/ethnic prejudice – suggesting important nuance in our model.

A second possibility for these inconsistent mediation findings is that both zero-sum beliefs and perceived competition may be indicators of a larger common latent factor. We investigated this possibility by analyzing the zero-sum and perceived competition items using an exploratory factor analysis. In both Studies 2 and 3, the findings suggest that the zero-sum items load onto a different latent factor than the perceived competition items (see Supplementary Materials). This finding is consistent with theoretical differences between zero-sum beliefs and perceived competition. Zero-sum beliefs are about winners and losers, whereas competition may not necessarily translate into winners and losers. That is, when groups are competing for resources, they may not necessarily think that resources are finite and may not necessarily consider “winners” or “losers.” Therefore, while psychologically interrelated, they are acting as different constructs. That said, zero-sum beliefs and perceived competition may both be indicators for a second-order latent construct. If so, this may explain why we do not find a consistent pattern of results across studies as there are likely differences due to sampling variability.

A final possibility for inconsistent findings may be attributed to important differences between racial/ethnic groups. Our findings suggest that zero-sum beliefs may be particularly important for Black and White Americans when considering the relationship between economic inequality and prejudice, but perceived competition may be particularly important for Latinx Americans. Although we are unsure why these differences emerge between racial/ethnic groups

of participants, we think it may be important to consider the history in the US. In particular, for Black and White Americans, economic resources have often followed a zero-sum distribution whereby White Americans took more resources, often at the expense of Black Americans. Broadly, economic resources between White and Latinx/Hispanic Americans have, at times, also followed a zero-sum distribution. However, important differences in these racial/ethnic histories – including the relatively recent emergence and use of the term ‘Latinos’, as opposed to Hispanic, in the U.S. (Lopez et al., 2022) – may, in part, be why we see different mediational patterns between groups. That said, more research is needed.

Finally, while the present work investigates the relationship between inequality and prejudice, future research should investigate the whole cyclical pattern. Our findings highlight the importance of understanding both pathways as there is likely a feedback loop that makes inequality and prejudice mutually reinforcing. This would suggest that structural changes which reduce economic inequality may naturally lead to reduced prejudice, which may further serve the goal of reducing inequality.

Conclusion

Inequality continues to rise in the U.S, and this has become particularly salient throughout the course of the COVID-19 pandemic. The most vulnerable populations are most likely to experience hospitalization, declines in well-being, and job loss as a result of the pandemic, making now a crucial time to investigate the varied consequences of this inequality. The present work finds that high inequality leads to heightened zero-sum beliefs and competition, which in turn lead to increased prejudice among a variety of social groups. However, reducing perceived competition and zero-sum beliefs reduces intergroup prejudice. This program of research extends prior work to suggest that inequality and prejudice are in fact

part of a mutually reinforcing cyclical process. Understanding what drives and mitigates this process is another step towards reducing both inequality and prejudice in the U.S.

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