

# The Psychology of Asymmetric Zero-Sum Beliefs

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Zero-sum beliefs reflect the perception that one party's gains are necessarily offset by another party's losses. Although zero-sum relationships are, from a strictly theoretical perspective, symmetrical, we find evidence for *asymmetrical zero-sum beliefs*: The belief that others gain at one's own expense, but not vice versa. Across various contexts (international relations, interpersonal negotiations, political partisanship, organizational hierarchies) and research designs (within- and between-participant), we find that people are more prone to believe that others' success comes at their own expense than they are to believe that their own success comes at others' expense. Moreover, we find that people exhibit asymmetric zero-sum beliefs only when thinking about how their own party relates to other parties but not when thinking about how other parties relate to each other. Finally, we find that this effect is moderated by how threatened people feel by others' success and that reassuring people about their party's strengths eliminates asymmetric zero-sum beliefs. We discuss the theoretical contributions of our findings to research on interpersonal and intergroup zero-sum beliefs and their implications for understanding when and why people view life as zero-sum.

**Keywords:** zero-sum beliefs, intergroup relations, interpersonal relations, conflict, perceived threat

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When siblings squabble over the last cookie in the jar, companies compete for a larger market share, and countries clash over contested territories, the distribution of resources often seems zero-sum. In such situations, each party's gains are necessarily offset by another party's losses, and one's success inevitably comes at others' expense. Yet, what often appears as a zero-sum situation may in fact be non-zero-sum (Fisher et al., 2011) and distinguishing between the two is not always easy. Siblings may resolve their disputes by convincing their parents to buy more cookies, companies may create new revenue streams by expanding into new markets, warring countries may mutually prosper from nonviolent resolutions, and so forth. When do people, companies, and foreign powers appraise a situation as zero-sum?

Rather than seeing a situation as either zero-sum or non-zero-sum, we argue that people exhibit *asymmetrical zero-sum beliefs*—the belief that other parties gain at one's own expense, but not vice versa. Although the logic of a zero-sum game dictates that one party's gains are always offset by another party's losses (and that this is the case regardless of which party gains and which party loses), we argue


that zero-sum beliefs do not dutifully follow such logic. Rather, we suggest that people view situations as zero-sum when considering how much others are gaining, but as non-zero-sum when considering how they themselves are gaining. Specifically, we argue that in both interpersonal and intergroup contexts, people view others' gains as coming at their own expense, but do not necessarily view their own gains as coming at others' expense. Thus, *the same relationship* can be seen as either zero-sum or non-zero-sum, depending on whether people focus on their own or others' gains.

Whether people view an interpersonal or intergroup relationship as zero-sum is critical for understanding their behavior in it (e.g., Liu et al., 2019; Rózycka-Tran et al., 2015; Stefaniak et al., 2020). Although knowing whether a situation is objectively zero-sum is important, what ultimately influences behavior is whether people view it as such. Because beliefs often diverge from reality, focusing on zero-sum beliefs—whether people believe that one party's gains can only be obtained at the cost of another party's losses—is critical for understanding when and why people behave competitively versus cooperatively. For instance, although many negotiations offer opportunities for mutual gain, negotiators often erroneously assume that their interests are directly opposed to those of their bargaining partners and thus fail to maximize their profits (Thompson & Hastie, 1990). In contrast, realizing that a situation is not zero-sum allows negotiators to shift from a competitive to a cooperative stance and reach optimal and mutually beneficial agreements (Bazerman, 1983).

## The Psychology of Zero-Sum Beliefs

To date, zero-sum beliefs have been studied in two primary ways. On the one hand, these beliefs have been conceptualized as pre-existing generalized mindsets about social relations and economic exchanges (broadly construed as “zero-sum thinking”; e.g., Johnson et al., 2021; Rózycka-Tran et al., 2015) as well as a generalized

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mindset about negotiations (“the fixed-pie bias”; Bazerman, 1983). These mindsets, which involve a view of social relations as governed by scarce resources and incompatible interests, impact interpersonal and intergroup relations and affect both countries (e.g., governmental functioning; Piotrowski et al., 2019; Różycka-Tran, Jurek, et al., 2019) and individuals (e.g., lower life satisfaction, suboptimal negotiated outcomes; Różycka-Tran, Piotrowski, et al., 2019; Thompson & Hastie, 1990). On the other hand, zero-sum beliefs have been conceptualized as specific perceptions of how parties impact their counterparts’ outcomes within given contexts. For instance, rather than measuring general zero-sum views about social relationships, researchers have examined whether people specifically believe that immigrants gain at native-born residents’ expense (Davidai & Ongis, 2019; Esses et al., 1998), racial minorities gain at the majority’s expense (e.g., Brown & Jacoby-Senghor, 2021; Norton & Sommers, 2011), women gain at men’s expense (Kuchynka et al., 2018; Ruthig et al., 2017; Sicard & Martinot, 2018; Wong et al., 2017), sexual minorities gain at religious groups’ expense (Wilkins et al., 2021), and so forth. Recently, it has been shown that such specific zero-sum beliefs (e.g., about gender relations) are malleable, context dependent, and do not necessarily reflect a generalized mindset (e.g., about intergroup relations; Wilkins et al., 2015). For instance, zero-sum beliefs are influenced by perceptions of the economy (Siroła & Pitesa, 2017) and the status-quo (Davidai & Ongis, 2019), mental models of causality (Smithson & Shou, 2016), organizational procedures (Andrews Fearon & Davidai, 2021), and experiences of symbolic threat (Smithson et al., 2015) and personal relative deprivation (Ongis & Davidai, in press). Thus, although a generalized mindset indicates a readiness to view social relations as zero-sum, contextual factors clearly play an important role in determining whether people exhibit these beliefs within any given situation.

In this article, we suggest one such critically important factor—the identity of the gaining party. Specifically, we argue that people exhibit zero-sum beliefs when focusing on others’ gains (and how those gains affect their outcomes), but not when focusing on their own gains (and how they affect others’ outcomes). Like a Necker cube illusion, people are ready to view the same situation as either zero-sum or non-zero-sum, depending on who they believe is gaining. As a result, we argue that people exhibit asymmetrical zero-sum beliefs, viewing others’ success as coming at their expense, but their success as not necessarily coming at others’ expense.

### The Psychology of Asymmetrical Zero-Sum Beliefs

There are several reasons why people might exhibit *asymmetrical* zero-sum beliefs. First, people are more psychologically impacted by their losses than their equivalent gains (Kahneman & Tversky, 1979; Ruggeri et al., 2020), pay closer attention to negative than positive information (Baumeister et al., 2001; Rozin & Royzman, 2001), disproportionately focus on the potential downsides of their economic transactions (Kahneman et al., 1991), and compare themselves to better-off rather than worse-off others (Davidai & Deri, 2019; Davidai et al., 2020; Deri et al., 2017; Putnam-Farr & Morewedge, 2021). At the same time, people are sensitive to how well others are doing and are more likely to notice, attend to, and remember others’ benefits and advantages than difficulties and disadvantages (Davidai & Gilovich, 2016; Hansson et al., 2021).

Consequently, people may find it especially easy to recall instances when others’ gains coincide with their losses (vs. instances when their own gains coincide with others’ losses) as well as instances when others are treated better than them (vs. instances when they have been treated better than others have). Moreover, even when people do notice that their gains coincide with others’ losses, they may minimize it as an unfortunate side effect of their otherwise benevolent intentions. In contrast, people are much less charitable about others’ motives and may view others’ gains as intentionally (rather than unintentionally) harming them. Thus, people may view themselves as benevolent actors whose success benefits all parties involved yet see others as self-interested agents motivated by a desire to gain at their expense (Cricher & Dunning, 2011; Miller, 1999). Accordingly, people may come to believe that their losses have been brought about by others’ gains but that their gains had nothing to do with others’ losses.

Underlying all these reasons for asymmetrical zero-sum beliefs—the ease with which people can bring to mind instances when others’ gain and they lose, the mental availability of instances when others have been treated better than oneself, and the belief that others’ gains intentionally harm oneself—is the experience of threat that people feel when considering their own and others’ gains and losses. Regardless of whether it is based on actual material reasons or due to (biased) perceptions of one’s own and others’ outcomes, feeling threatened may lead people to perceive a zero-sum relationship between their own and others’ outcomes, seeing others’ success as coming at their own expense (e.g., Esses et al., 2010). In contrast, because thinking about one’s own gains does not elicit threat, people are unlikely to consider how others are doing when they themselves are winning and may therefore view their own success as unrelated to others’ failures (i.e., non-zero-sum).

The idea that feeling threatened fosters asymmetric zero-sum beliefs—such that others’ gain at one’s own expense but that one’s gains do not come at others’ expense—suggests that people’s judgments are at odds with the logic of zero-sum games as put forth by traditional game theory (Schelling, 1958; von Neuman & Morgenstern, 1944). Specifically, game theory suggests that (a) a situation is either zero-sum (i.e., the sum of all parties’ payoffs amount to zero) or non-zero-sum (i.e., joint outcomes can be positive or negative), (b) “zero-sumness” is an objective feature of a situation (i.e., independent from each party’s identity), and (c) zero-sum relationships are therefore inherently symmetrical (i.e., each party’s gains can only be obtained at the expense of another party’s losses). We argue that zero-sum beliefs do not dutifully follow such logic. Regardless of whether one’s relationship with others is objectively zero-sum, we argue that feeling threatened by others’ gains may lead people to view it as such. That is, people may not hold generalized zero-sum beliefs about specific social contexts (e.g., that trade in general is zero-sum), but rather exhibit asymmetric beliefs depending on who they believe is gaining (or losing) from a given exchange.

### Research Overview

In seven studies (including two preregistered experiments), we examine the psychology of asymmetric zero-sum beliefs. Studies 1 and 2 examine whether people believe that other countries (Study 1) and people (Study 2) gain at their expense, but not vice versa. Study 3 examines whether asymmetric zero-sum beliefs are unique

to contexts that directly involve one's own party, but not to contexts that involve other parties' relations to one another. We show that people exhibit asymmetric zero-sum beliefs when considering how their own country's outcomes relate to another country's outcomes (i.e., U.S.–China relations), but not when thinking about two separate countries (i.e., Germany–China relations). Study 4 replicates and extends this effect in the domain of political parties and examines the role of threat in asymmetric zero-sum beliefs. We examine whether the degree to which political partisans feel threatened by an opposing party predicts how much they see that party as gaining at their own party's expense. Finally, Studies 5, 6A, and 6B examine the causal role of threat on asymmetric zero-sum beliefs in both interpersonal and intergroup contexts by manipulating how threatened people feel by an opposing party. We find that people exhibit asymmetric zero-sum beliefs when feeling threatened by others' success, but not when feeling reassured about their own success.

For all studies, we report all conditions run and measures collected. Sample sizes were determined in advance and analyses were conducted only after data collection was complete. The materials and data can be accessed through the Open Science Framework: [https://osf.io/tf9sj/?view\\_only=bde06c8751e741aaa5139ed2b5c703cf](https://osf.io/tf9sj/?view_only=bde06c8751e741aaa5139ed2b5c703cf).

## Study 1

We began by examining asymmetric zero-sum beliefs in international relations. Although zero-sum relationships are, from a theoretical standpoint, symmetrical, we predicted that U.S. participants would exhibit *asymmetrical zero-sum beliefs*—the belief that other countries gain at the United States' expense, but not vice versa. Specifically, we predicted that participants would be more prone to view U.S.–China relations as zero-sum when considering China's economic and geopolitical gains than when considering similar gains made by the U.S. Whereas participants would view China's success as coming at the expense of the U.S., they would not necessarily view U.S. success as coming at China's expense.

**Table 1**

*Zero-Sum Statements From Study 1*

Zero-sum statements	U.S. gains <i>M</i> ( <i>SD</i> )	China gains <i>M</i> ( <i>SD</i> )	ANOVA
The rise of companies in China [the U.S.] comes at the expense of U.S. [Chinese] companies	3.03 (1.39)	4.29 (1.77)	$F = 30.76, p < .001$ $\eta_p^2 = .136$
China's emergence [the United States' status] as a global leader comes at the expense of the United States' [China's] status in the global community	3.44 (1.49)	4.18 (1.70)	$F = 10.42, p = .001$ $\eta_p^2 = .050$
A stronger Chinese [U.S.] economy means a weaker U.S. [Chinese] economy	3.12 (1.49)	3.73 (1.69)	$F = 7.22, p = .008$ $\eta_p^2 = .036$
As China's [U.S.] power in the world expands, U.S. [China's] power becomes more limited	3.61 (1.52)	4.19 (1.65)	$F = 6.59, p = .011$ $\eta_p^2 = .033$
As China's [the United States'] economic power increases, the United States' [China's] economic power decreases	3.43 (1.53)	3.96 (1.60)	$F = 5.58, p = .019$ $\eta_p^2 = .028$
The easier it is for people in China [the U.S.] to get a job, the more difficult it is for people in the United States [China] to get jobs	2.78 (1.54)	3.29 (1.76)	$F = 4.78, p = .030$ $\eta_p^2 = .024$
The richer people in China [the U.S.] grow, the poorer U.S. [Chinese] citizens become	2.67 (1.44)	3.10 (1.54)	$F = 4.09, p = .044$ $\eta_p^2 = .020$
China's [U.S.] foreign interests are typically opposed to U.S. [China's] foreign interests	4.04 (1.32)	4.28 (1.54)	$F = 1.44, p = .229$ $\eta_p^2 = .007$

*Note.* ANOVA = analysis of variance.

## Method

### Participants

Based on a simple heuristic of 100 participants per condition to maximize power, we aimed to recruit a total of 200 participants. Two hundred three U.S. residents from Amazon's Mechanical Turk participated in the study. We excluded from analyses three participants who failed to complete the dependent measures and two who failed a simple attention check, leaving a sample of 198 participants ( $M_{\text{age}} = 34.55$ ; 73 female, 123 male, 2 other/prefer not to say; 73.7% White, 6.6% Black, 7.6% Hispanic, 9.1% Asian, <1% Native American). This sample size allows us to detect effects as small as  $d = 0.40$  with 80% power.

### Materials and Procedure

We randomly assigned participants to one of two conditions in which they indicated whether they saw the U.S. and China as engaged in a zero-sum competition over economic and geopolitical resources. In the *China gains condition*, participants indicated the extent to which they saw China's success as coming at the expense of the U.S. Participants read eight statements depicting potential Chinese gains and indicated how much each gain was balanced by an equivalent U.S. loss (e.g., "The richer people in China grow, the poorer U.S. citizens become"; 1 = *Strongly disagree*, 7 = *Strongly agree*;  $\alpha = 0.92$ ). In the *U.S. gains condition*, participants saw eight similar statements concerning U.S.–China relations and indicated how much the gains made by the U.S. come at China's expense (e.g., "The richer people in the United States grow, the poorer Chinese citizens become";  $\alpha = 0.88$ ; Table 1). Finally, participants completed a simple attention check and a set of demographic measures.

## Results

We predicted that participants would exhibit asymmetrical zero-sum beliefs about U.S.–China relations, believing that China's success comes at the U.S. expense, but that U.S. success does

not come at China's expense. Indeed, a one-way multivariate analysis of variance testing for between-condition differences among the eight zero-sum statements revealed a significant effect, Wilk's  $\lambda = .15$ ,  $F(8, 189) = 4.18$ ,  $p < .001$ ,  $\eta_p^2 = .15$ , suggesting that participants were more prone to view China's gains as coming at the United States' expense than vice versa. A series of independent analyses revealed similarly significant results for seven of the eight statements (see Table 1). Thus, participants exhibited asymmetric zero-sum beliefs about U.S.–China relations, viewing them as significantly more zero-sum when contemplating China's geopolitical and economic success than when considering similar success by the U.S.

Importantly, since views about U.S.–China relations may vary by political ideology, it is necessary to examine whether participants exhibit asymmetric zero-sum beliefs beyond any effect of their ideological beliefs. For instance, Davidai and Ongis (2019) found that people across the political spectrum hold zero-sum beliefs when it benefits them to do so, resulting in asymmetric beliefs that vary by ideology and by whether an issue is seen as maintaining or challenging the status-quo. Because we argue that asymmetric zero-sum beliefs are a general (rather than merely political) phenomenon, we conducted an additional multiple linear regression predicting zero-sum beliefs from condition (China gains vs. U.S. gains), participants' political ideology (*Very liberal* to *Very conservative*), and their interaction. This analysis revealed a significant main effect of condition,  $\beta = 0.78$ ,  $t(194) = 2.07$ ,  $p = .040$ , but no effect of ideology,  $\beta = 0.03$ ,  $t(194) = 0.41$ ,  $p = .682$ , or an interaction effect,  $\beta = 0.05$ ,  $t(194) = 0.55$ ,  $p = .583$ . Regardless of whether they identified as conservative or liberal, participants exhibited asymmetric zero-sum beliefs about U.S.–China relations.

## Discussion

Although people vary in their generalized beliefs that life is zero-sum (Rózycka-Tran et al., 2015), these beliefs should be theoretically independent of who is gaining (or losing). Yet, as shown in Study 1, people exhibit asymmetric zero-sum beliefs, seeing others' success as coming at their own expense, but not vice versa. Specifically, participants exhibited asymmetric zero-sum beliefs about U.S.–China relations, viewing China as more likely to gain at the expense of the U.S. than vice versa. It should be noted, however, that political rhetoric about international relations (and, more specifically, about U.S.–China relations, as was widely promoted by right-wing politicians during the 2016 U.S. Elections and the ensuing administration's term; e.g., ABCNews, 2016; CNBC, 2018) may make this context especially susceptible to asymmetric zero-sum beliefs. Therefore, it is important to examine whether these beliefs arise even in the absence of such rhetoric. To do so, we next examine asymmetric zero-sum beliefs in a markedly nonpolitical, interpersonal context.

## Study 2

Study 2 expands these results in three important ways. First, we examine asymmetric zero-sum beliefs in a commonplace, interpersonal economic exchange: negotiation over the purchase of a car. Since participants in Study 1 may have been, at least partially, influenced by political rhetoric that characterizes international relations as zero-sum, documenting asymmetric zero-sum beliefs

in an interpersonal and markedly apolitical context would attest to the findings' robustness and generalizability. Second, Study 2 is a substantially more conservative test of our hypothesis, asking participants, in a within-participant design, to consider how their gains affect others' outcomes *as well as* how others' gains affect their own outcomes. Finally, we preregistered the hypothesis, materials, and analyses (<https://aspredicted.org/v8zf3.pdf>). We predicted that, regardless of their role in a negotiation, participants would be more prone to see the negotiation as zero-sum when considering how their counterpart's gains affect their outcomes than when considering how their own gains affect their counterpart's outcomes. Whereas participants would view the buyer/seller as gaining at their expense, they would not necessarily view their own gains as coming at the buyer's/seller's expense.

## Method

### Participants

Based on Study 1's results, we aimed to recruit 100 participants (see preregistration). One hundred one U.S. residents were recruited from Amazon's Mechanical Turk. We excluded from analyses 1 participant who failed a simple attention check, leaving a final sample of 100 participants ( $M_{\text{age}} = 40.71$ ; 45 female, 55 male; 72% White, 5% Black, 1% Hispanic, 10% East Asian, 5% South Asian, 1% Middle Eastern/Arabic). This sample size allows us to detect effects as small  $\eta_p^2 = .039$  in a  $2 \times 2$  mixed-model analysis of variance (ANOVA) with 80% power.

### Materials and Procedure

We randomly assigned participants to one of two conditions involving a purchase of a car. In the *Buyer condition*, participants imagined buying a car and negotiating with the seller the price, payment timing, and other terms of the deal. In the *Seller condition*, participants imagined selling their car and negotiating these terms with a potential buyer. In both conditions, participants were asked to write down their strategy for the negotiation:

How will you make sure that you get a good deal? What will you do? What will you ask them? How will you know if they're being honest with you? And, if they turn out to be a tough negotiator, how will you respond?

Next, participants indicated whether their gains in the negotiation would come at the buyer's/seller's expense and vice versa. Using two 4-item measures, they indicated, in counterbalanced order, how their negotiation outcomes will affect the other party's outcomes (e.g., "The better terms I get out of this deal, the worse-off the buyer/seller will be") and how the other party's outcomes will affect their own outcomes (e.g., "The better terms the buyer/seller gets out of this deal, the worse-off I will be"; 1 = *Strongly disagree*, 7 = *Strongly agree*;  $\alpha > 0.79$ ). Finally, participants completed an attention check and indicated their age, gender, and race/ethnicity.

## Results

We predicted that participants would exhibit asymmetrical zero-sum beliefs about the negotiation, viewing their counterpart's



success as coming at their expense, but their success as not necessarily coming at their counterpart's expense. Indeed, a mixed-model ANOVA with condition (*Buyer condition* vs. *Seller condition*) as a between-participants factor and target of judgment (*Buyer's gains* vs. *Seller's gains*) as a within-participants factor revealed a significant interaction,  $F(1, 98) = 18.22, p < .001, \eta_p^2 = .157$  (Figure 1). A series of planned contrasts found that participants in the *Buyer condition* (who imagined buying a car) were significantly more prone to view the seller as gaining at their expense ( $M = 5.14, SD = 1.33$ ) than vice versa ( $M = 4.45, SD = 1.44$ ),  $t(98) = 3.96, p < .001$ . In contrast, participants in the *Seller condition* (who imagined selling a car) viewed the buyer as more likely to gain at their expense ( $M = 4.82, SD = 1.14$ ) than vice versa ( $M = 4.43, SD = 1.30$ ),  $t(98) = 2.13, p = .035$ . Thus, regardless of whether they imagined buying or selling a car, participants exhibited asymmetric zero-sum beliefs, viewing their counterpart's gains as more likely to come at their expense than vice versa.

## Discussion

Study 2 conceptually replicated and extended Study 1 in a nonpolitical domain. As before, participants exhibited asymmetric zero-sum beliefs, viewing others as more prone to gain at their expense than vice versa. Whereas participants who imagined buying a car viewed the seller's gains (but not the buyer's gains) as zero-sum, participants who imagined selling a car viewed the buyer's gains (but not the seller's gains) as zero-sum. Additionally, although not integral to our thesis, the fact that we observed a slightly larger asymmetry when thinking about a seller's gains than when thinking about a buyer's gains is consistent with people's tendency to see sellers as more prone than buyers to benefit from economic transactions (Johnson et al., 2021). Nevertheless, when imagining themselves as the buyer or the seller in a negotiation, participants

believed that the other side is more prone to gain at their expense than vice versa.

## Study 3

Study 3 examines a boundary condition of asymmetric zero-sum beliefs, testing whether people exhibit such beliefs when thinking about their own country's relations with other countries (e.g., Americans thinking about U.S. foreign relations), but not when thinking about other countries' relations to one another (e.g., Americans thinking about the relations of two separate countries). We predicted that participants would exhibit asymmetric zero-sum beliefs when thinking about U.S.–China relations (i.e., how another country relates to their own country) but not when thinking about China's relations with another Western, rich, educated, and industrialized democracy—Germany. When it comes to U.S.–China relations, we expected participants to view China's success as coming at the U.S. expense, but not vice versa. In contrast, when it comes to Germany–China relations, we expected them to exhibit symmetric beliefs, viewing Germany and China as equally likely to gain or lose at each other's expense.

## Method

### Participants

Based on the effect sizes in Study 1, we aimed to recruit 200 participants. Two hundred five U.S. residents were recruited from Amazon's Mechanical Turk. We excluded from analyses five participants who did not complete the dependent variables and two who failed an attention check, leaving a sample of 198 participants ( $M_{age} = 36.36$ ; 91 female, 107 male; 81.3% White, 6.1% Black, 5.6% Hispanic, 6.1% Asian, 1% Native American). This sample size allows us to detect effects as small as  $\eta_p^2 = .019$  in a  $2 \times 2$  between-participant factorial design with 80% power.

**Figure 1**

*Zero-Sum Beliefs About Bargaining Outcomes as a Function of Condition (Participants as the Buyer vs. Seller) and Judgment Target (Buyer's Gains vs. Seller's Gains; Study 2) (Error bars represent SEs)*



## Materials and Procedure

We randomly assigned participants to one of four conditions in a  $2 \times 2$  between-participant design. Participants were assigned to consider whether China was engaged in a zero-sum competition with the U.S. (*U.S.–China relations condition*, a direct replication of Study 1) or with Germany (*Germany–China relations condition*). In addition, they were also assigned to consider how China's success influences other countries (either the U.S. or Germany, depending on condition) or how these other countries' success influences China. In all conditions, participants indicated their zero-sum beliefs on eight different items using 7-point Likert scales (1 = *Strongly disagree*, 7 = *Strongly agree*). Thus, participants were randomly assigned to indicate whether China gains at the U.S. expense, whether the U.S. gains at China's expense, whether China gains at Germany's expense, or whether Germany gains at China's expense (Table 2). Finally, participants completed an attention check and a series of demographic measures.

## Results

We predicted that participants would exhibit asymmetric zero-sum beliefs when thinking about how their own country relates to other countries (U.S.–China relations), but not when thinking about how two different countries relate to each other (Germany–China relations). As predicted, a  $2 \times 2$  ANOVA with relationship (*U.S.–China vs. Germany–China*) and condition (*China gains vs. U.S./Germany gains*) as between-participant factors revealed a significant interaction,  $F(1, 197) = 6.51, p = .010, \eta_p^2 = 0.03$ . Participants who thought about U.S.–China relations exhibited asymmetric zero-sum beliefs, viewing the relationship between the two countries as more zero-sum when considering how China's success influences the U.S. ( $M = 3.64, SD = 1.04$ ) than when considering how U.S. success influences China ( $M = 2.99, SD = 1.03$ ),  $p = .017$ . In contrast, participants who thought about Germany–China relations did not exhibit such asymmetric beliefs, viewing China as having the same effect on Germany ( $M = 3.16, SD = 1.21$ ) as Germany has on China ( $M = 3.30, SD = 1.07$ ),  $p = .547$  (Figure 2). Thus, consistent with our hypothesis, participants exhibited asymmetric zero-sum beliefs about U.S.–China relations but not about Germany–China relations. When thinking about two countries in which they had no personal stake, participants exhibited symmetric beliefs, seeing each country's gains as equally likely to be balanced by the other country's losses. However, when considering how *their own country* relates to other countries,

participants exhibited asymmetric zero-sum beliefs, believing that China succeeds at the U.S. expense but not vice versa.

## Discussion

Study 3 found further evidence for asymmetric zero-sum beliefs. Specifically, participants exhibited asymmetric zero-sum beliefs about international relations when considering their own country's relations with another country (U.S.–China relations), but not when thinking about Germany–China relations—two countries in which they did not have a personal stake. Yet, the U.S. and Germany differ in many respects, and one may wonder whether beliefs about Germany–China relations are an appropriate point of comparison for beliefs about U.S.–China relations. Although such comparisons should always be taken with a grain of salt, we chose Germany as the reference country for several reasons: its relatively large Gross Domestic Product (4th in the world, after the U.S., China, and Japan), its population size (largest Western country, after the U.S.), its shared cultural heritage with the U.S., its volume of trade with China (largest in Europe and 2nd in the Western world, after the U.S.), and because participants are unlikely to have been of German nationality or to have had preconceived beliefs about Germany–China relations. Thus, although no comparison is perfect, Germany–China relations seem to be the most proximal comparison for U.S.–China relations of all other Western, educated, industrial, rich, and democratic countries.

## Study 4

Study 4 examines asymmetric zero-sum beliefs in a new domain beyond international relations and interpersonal negotiations. Specifically, we examine whether political partisans view the opposing party's gains as coming at their own party's expense, but not vice versa. Focusing on policy victories and legislative successes (which, unlike electoral success, can often result in Pareto improvements and are therefore non-zero-sum; Stiglitz, 1998), we predicted that both Republicans and Democrats would view the other party's success as coming at the expense of voters from their own party (i.e., *zero-sum*), but their own party's success as benefiting people from both parties (i.e., *non-zero-sum*).

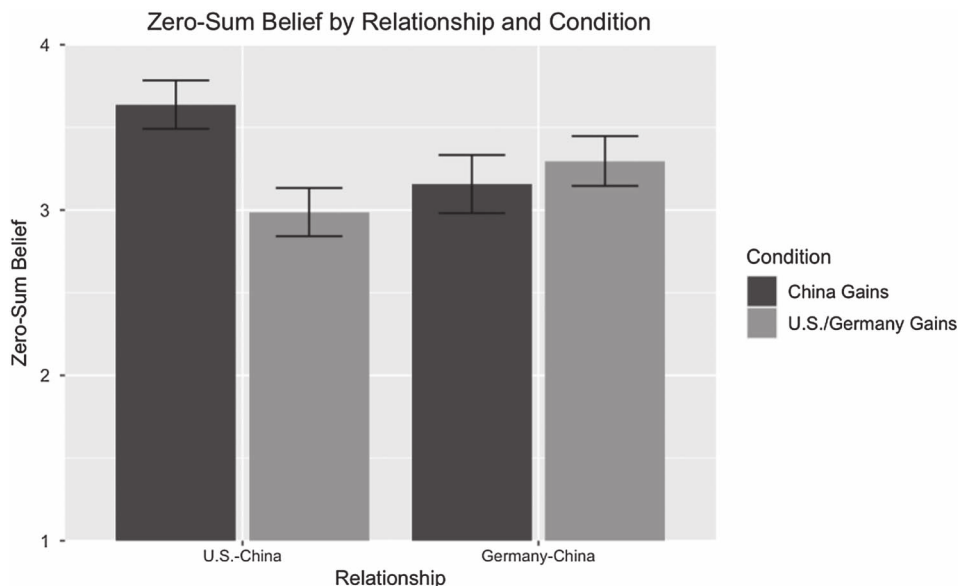
In addition, Study 4 examines whether feeling threatened by others' success moderates zero-sum beliefs. As discussed above, people feel threatened when their losses coincide with others' gains and often view others' advantages as their disadvantages (e.g., Crusius & Lange, 2014; Davidai & Gilovich, 2016). Consequently, feeling threatened may lead people to view others' success as coming at their own expense (Esses et al., 2010). In contrast, since

**Table 2**

*Example Materials From Study 3*

Condition	U.S.–China relations condition	Germany–China relations condition
China's gains	Example items ( $\alpha = .89$ ): A stronger Chinese economy means a weaker U.S. economy As China's power in the world expands, U.S. power becomes more limited	Example items ( $\alpha = .93$ ): A stronger Chinese economy means a weaker German economy As China's power in the world expands, Germany's power becomes more limited
U.S./Germany gains	Example items ( $\alpha = .90$ ): A stronger U.S. economy means a weaker Chinese economy As U.S. power in the world expands, China's power becomes more limited	Example items ( $\alpha = .88$ ): A stronger German economy means a weaker Chinese economy As Germany's power in the world expands, China's power becomes more limited

**Figure 2**  
Zero-Sum Beliefs About U.S.–China (Left) and Germany–China (Right) Relations as a Function of Whether China or the U.S./Germany Are Gaining (Study 3) (Error bars represent SEs)



people have no reason to be threatened by their own success, we predicted that they would be less vigilant about how their gains affect others' outcomes and would be less prone to view them as zero-sum.

## Method

### Participants

Based on a pilot study's results, and to maximize the number of responses from both sides of the political aisle, we aimed to recruit 400 participants. Four hundred fourteen U.S. residents were recruited from Amazon's Mechanical Turk. We excluded from analyses 11 participants who did not complete the dependent variables and 20 who failed an attention check, leaving a sample of 383 participants ( $M_{age} = 35.35$ ; 142 female, 241 male; 75.7% White, 11.2% Black, 6.5% Asian, 3.9% Hispanic, 1.8% Native American). This sample size allows us to detect effects as small as  $\eta_p^2 = .010$  in a  $2 \times 2$  between-participant factorial design with 80% power.

### Materials and Procedure

Participants first indicated their political party affiliation ("Generally speaking, how do you usually think of yourself in terms of political affiliation?"; 169 Democrats, 115 Republicans, and 99 Independents). Those who identified as Independent were further asked whether they tended to lean Democrat ( $n = 60$ ) or lean Republican ( $n = 39$ ).<sup>1</sup>

Next, participants completed, in counterbalanced order, a measure of perceived threat and a measure of zero-sum beliefs about political victories and legislative successes. First, they reported how threatened they felt, and how threatened people should generally feel, by the opposing party's success (e.g., "How personally worried are you about the amount of influence that Democratic [Republican]

lawmakers have in Congress?"; 1 = *Not at all worried*, 5 = *Extremely worried*;  $\alpha_{Democrats} = 0.86$ ,  $\alpha_{Republicans} = 0.85$ ). Second, they indicated whether they viewed a zero-sum competition between the Republican and Democratic parties. They were randomly assigned to one of two conditions, in which they indicated whether the Republican Party's success or the Democratic Party's success comes at the opposing party's expense. In the *Republican gains condition*, participants saw six statements about potential Republican gains and indicated how much each gain entailed an equivalent loss to voters of the Democratic Party (e.g., "The more resources the government spends on predominantly Republican regions in the U.S. ['Red' states], the less it can spend on predominantly Democratic regions ['Blue' states]"; 1 = *Strongly disagree*, 7 = *Strongly agree*;  $\alpha = 0.83$ ). In the *Democratic gains condition*, participants saw six similar statements and indicated how much the Democratic Party's gains entailed equivalent losses to voters of the Republican Party (e.g., "The more resources the government spends on predominantly Democratic regions in the U.S. ['Blue' states], the less it can spend on predominantly Republican regions ['Red' states]";  $\alpha = 0.84$ ; see Supplemental Materials).

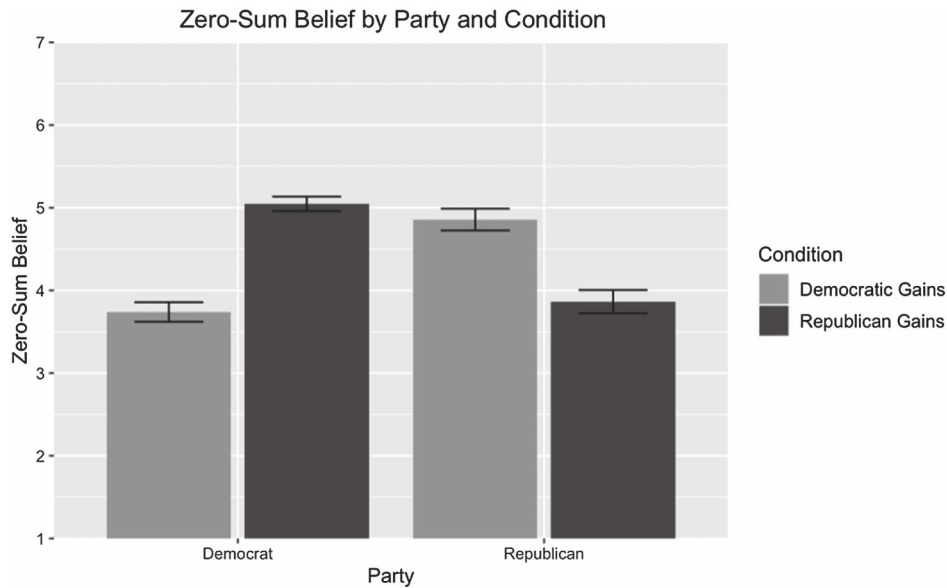
## Results

We predicted that participants across the political spectrum would exhibit asymmetric zero-sum beliefs, viewing the opposing party's success as coming at their own party's expense, but not vice versa. Indeed, a  $2 \times 2$  ANOVA with political affiliation (*Republican vs. Democrat*) and condition (*Republican gains vs. Democratic gains*) as between-participant factors revealed a significant interaction,  $F(1, 379) = 93.53$ ,  $p < .001$ ,  $\eta_p^2 = 0.20$  (Figure 3).

<sup>1</sup> The results remain the same when excluding participants who identify as Independent (Supplemental Materials).

**Figure 3**

*Zero-Sum Beliefs About Political Gains as a Function of Party Affiliation (Democrat vs. Republican) and Condition (Democratic Gains vs. Republican Gains; Study 4) (Error bars represent SEs)*



Whereas Republican participants saw the Democratic Party's success as coming at Republican voters' expense ( $M = 4.86$ ,  $SD = 1.16$ ), they were less likely to view their own party's success as coming at Democratic voters' expense ( $M = 3.86$ ,  $SD = 1.22$ ),  $p < .001$ . In contrast, Democrats saw the Republican Party's success as coming at Democratic voters' expense ( $M = 5.05$ ,  $SD = 0.94$ ) but were less likely to view their own party's success as coming at Republican voters' expense ( $M = 3.74$ ,  $SD = 1.26$ ),  $p < .001$ . Thus, both Republicans and Democrats exhibited asymmetric zero-sum beliefs, viewing their own party's success as benefitting voters across the political spectrum but the opposing party's success as coming at their own voters' expense.

Next, we explored the role of threat in asymmetrical zero-sum beliefs. To do so, we re-sorted participants into one of two groups, based on whether they responded to zero-sum items about their own party's or the opposing party's gains. In the *own party's gains condition*, we grouped Republican participants who were asked about the Republican Party's gains with Democratic participants who were asked about the Democratic Party's gains. In the *opposing party's gains condition*, we grouped Republicans who were asked about the Democratic Party's gains with Democrats who were asked about the Republican Party's gains.

We predicted that feeling threatened would lead participants to view the *opposing party's gains* as zero-sum, but that it would have no effect on their views of their *own party's gains* as such. Indeed, a multiple linear regression predicting zero-sum beliefs from condition (own party's gains vs. opposing party's gains) and the continuous measure of threat revealed a significant interaction,  $\beta = 0.55$ ,  $t(379) = 5.05$ ,  $p < .001$ . The more participants felt threatened by the opposing party's success, the more they viewed it as coming at the expense of voters from their own party,  $\beta = 0.55$ ,  $t(192) = 8.38$ ,  $p < .001$ . In contrast, there was no relationship between how threatened participants felt by the opposing party's success and

how much they viewed their own party's success as zero-sum,  $\beta < 0.01$ ,  $t(187) < 0.01$ ,  $p = .998$ . Stated differently, only participants who felt threatened exhibited asymmetrical zero-sum beliefs (Figure 4).

## Discussion

Study 4 revealed initial evidence for the role of threat in asymmetric zero-sum beliefs, finding that threat moderates the belief that others gain at one's own expense (but not vice versa). Participants who felt threatened by the opposing party saw its success as coming at their own expense but did not view their own party's success as coming at the opposing party's expense. In contrast, participants who did not feel threatened thought that both parties were equally prone to gain or lose at each other's expense. It is important to note that Study 4 measured (rather than manipulated) the experience of threat, limiting the ability to make causal inferences. This correlational design makes it impossible to determine whether threat increases the belief that others gain at one's expense, whether viewing others as gaining at one's expense increases threat, or both, a point to which we return in the General Discussion. And, since a third, unmeasured variable (e.g., neuroticism) may be correlated with feelings of threat and with the belief that others gain at one's expense, it is difficult to conclude whether threat causally leads to asymmetric zero-sum belief. Therefore, in Study 5 we manipulate threat to examine its *causal* effect on zero-sum beliefs.

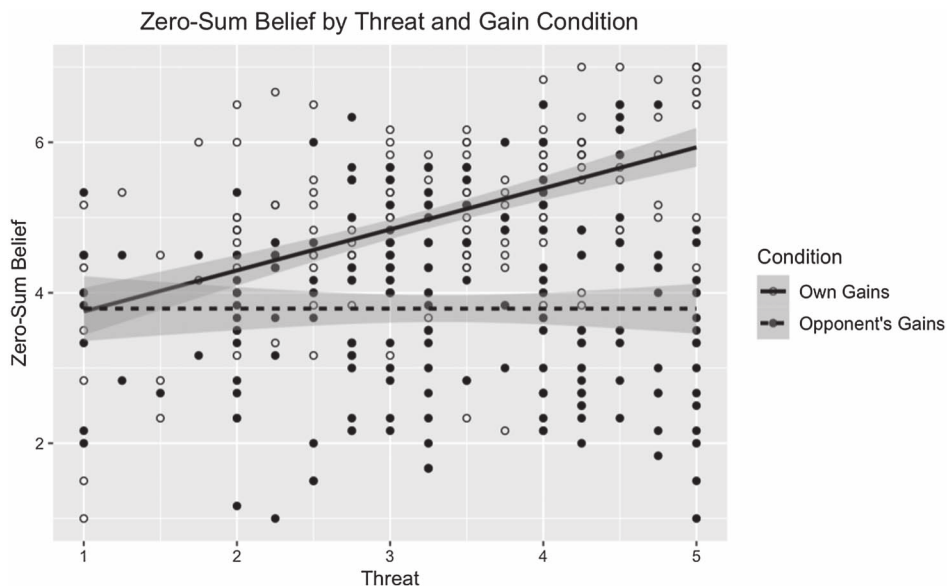
## Study 5

In Study 5, prior to measuring their views of U.S.–China relations, we manipulated how much threat participants felt in order to examine whether it causally impacts asymmetric zero-sum beliefs.



**Figure 4**

*Zero-Sum Beliefs as a Function of Perceived Threat and Condition (Own Gains Condition vs. Opponent's Gains Condition; Study 4)*



We predicted that participants would exhibit asymmetric beliefs about U.S.–China relations when viewing China as a threat to the U.S. In contrast, when not feeling threatened by China, we expected participants to exhibit symmetric beliefs, seeing China as likely to gain at the U.S. expense as vice versa.

## Method

### Participants

Based on the results of a pilot study and Studies 1 and 3, we aimed to recruit 800 participants. Eight hundred thirty-nine U.S. residents were recruited from Amazon’s Mechanical Turk. We excluded from analyses 37 participants who did not complete the dependent variables and 17 who failed an attention check, leaving a sample of 785 participants ( $M_{\text{age}} = 35.23$ ; 360 female, 418 male, 4 other/prefer not to say; 69.7% White, 12.3% Black, 6.4% Hispanic, 8.4% Asian, 1.4% Native American). This sample size allows us to detect effects as small as  $\eta_p^2 = .005$  in a  $2 \times 2$  between-participant factorial design and with 80% power.

### Materials and Procedure

Participants were randomly assigned to one of two conditions in which they saw a series of graphs about the U.S. and China. In the *Threat condition*, they viewed four graphs depicting potentially threatening information about China’s economic, military, and geopolitical power. Importantly, this information was explicitly chosen to depict China’s strengths in domains that are markedly not zero-sum. For instance, participants in the *Threat condition* viewed a graph showing China’s larger population size, a resource that is clearly not zero-sum (i.e., one country’s population has no bearing on the size of another country’s population). In the *No Threat condition*, participants viewed four similar graphs of

potentially nonthreatening information. Again, this information was chosen to reflect China’s relative weaknesses in domains that are markedly not zero-sum, such as the lower proportion of Chinese citizens with postsecondary education (i.e., the proportion of highly educated citizens in one country has no bearing on this proportion in another country).<sup>2</sup> In both conditions, participants completed a 5-item manipulation check of how threatened they felt by China (e.g., “How personally worried do you feel about the United States’ status in the world compared to China?” “In your opinion, how worried should U.S. citizens be about China’s economic growth?”; 1 = *None at all*, 5 = *A great deal*;  $\alpha = .87$ ).

Participants in the *Threat* and the *No Threat* conditions were further assigned to one of two conditions, in which they indicated how much U.S.–China relations are zero-sum using the same measures from Study 1. In the *China gains conditions*, participants indicated how much China’s success comes at the expense of the U.S. (e.g., “The rise of companies in China comes at the expense of U.S. companies”; 1 = *Strongly disagree*, 7 = *Strongly agree*;  $\alpha = .92$ ). In the *U.S. gains conditions*, they indicated how much U.S. success comes at China’s expense (e.g., “The rise of companies in the U.S. comes at the expense of Chinese companies”;  $\alpha = .90$ ). Finally, participants completed an attention check and various demographic measures.

## Results

First, we examined whether the manipulation influenced views of China as an economic and geopolitical threat to the U.S. Indeed, an independent samples *t*-test found that participants felt significantly

<sup>2</sup> Participants answered multiple-choice questions after viewing each graph. Although 87 participants answered at least one question incorrectly, removing them from analyses reveals similar results (Supplemental Materials).

more threatened by China in the *Threat condition* ( $M = 3.14$ ,  $SD = 0.93$ ) than the *No Threat condition* ( $M = 2.48$ ,  $SD = 0.96$ ),  $t(782) = 9.88$ ,  $p < .001$ ,  $d = 0.71$ .

Next, we examined whether feeling threatened influenced perceptions of U.S.–China relations as zero-sum. Even though participants viewed information in explicitly non-zero-sum domains, we predicted that feeling threatened by China’s advantages would lead them to view its success as coming at the United States’ expense, but not vice versa. As predicted, the  $2 \times 2$  ANOVA with threat (*Threat vs. No Threat*) and condition (*China gains vs. U.S. gains*) as between-participant factors revealed a significant interaction,  $F(1, 778) = 13.77$ ,  $p < .001$ ,  $\eta_p^2 = 0.02$ . A series of planned contrasts revealed that participants in the *Threat condition* were significantly more prone to view China’s success as zero-sum ( $M = 4.15$ ,  $SD = 1.14$ ) than they were to view U.S. success as such ( $M = 3.47$ ,  $SD = 1.20$ ),  $p < .001$ . In contrast, participants in the *No Threat condition* did not exhibit this asymmetry, believing that China ( $M = 3.68$ ,  $SD = 1.38$ ) and the U.S. ( $M = 3.65$ ,  $SD = 1.25$ ) are equally likely to succeed at each other’s expense,  $p = .998$ . In other words, participants exhibited asymmetrical zero-sum beliefs when they felt threatened by China, but not when they did not see China as a threat (Figure 5).

## Discussion

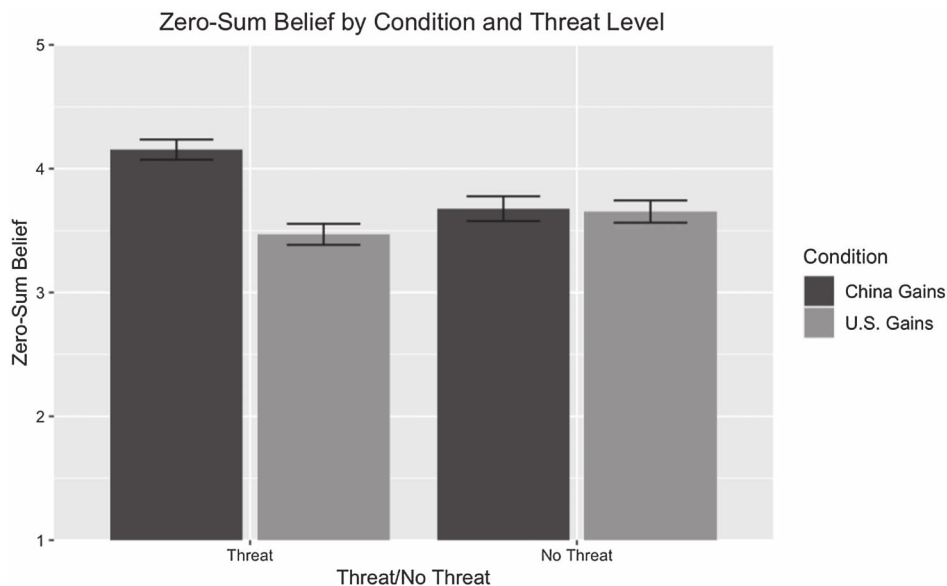
Study 5 offers initial evidence for the causal role of threat on asymmetric zero-sum beliefs. Whereas participants who focused on the relative weaknesses of the U.S. viewed China as more prone to gain at the U.S. expense than vice versa, those who focused on the relative strengths of the U.S. did not exhibit such asymmetric beliefs. Critically, although the U.S. economy benefits from an increase in population size (in which it trails China) and from an increase in the share of educated workforce (in which China trails the U.S.), these domains are markedly *non-zero-sum*, such that both

countries can simultaneously gain or lose. Thus, the fact that participants interpreted China’s non-zero-sum advantage as zero-sum is telling, especially since people easily differentiate between zero-sum and non-zero-sum competitions (e.g., Davidai et al., 2021). Of course, it is important to note that participants in the *No Threat condition* saw information about U.S. comparative advantage, and their beliefs may therefore reflect feelings of affirmation (of their country’s strengths) rather than a lack of threat. Although we return to this point in Study 6B (where we include a “neutral” control condition), differences in levels of experienced threat clearly led participants to view China as more likely to gain at the U.S. expense than vice versa.

## Studies 6A and 6B

Studies 1–5 documented asymmetric zero-sum beliefs about international relations, political partisanship, and interpersonal negotiations. Studies 6A and 6B replicate and expand these results in five important ways. First, we explore our findings in a new context, examining whether people believe that their colleagues succeed at their expense, but not vice versa. Second, we use a new manipulation of threat that, rather than emphasizing one’s relative strengths or weaknesses (i.e., comparative advantage), manipulates how threatened participants feel by the stakes of the situation they are in. Third, we examine how feeling threatened influences asymmetric zero-sum beliefs in a within-participant design, asking participants to consider how their success affects their colleagues’ outcomes as well as how their colleagues’ success affects their own outcomes. Fourth, we preregistered the hypotheses, methods, and data analyses in Study 6A (<https://aspredicted.org/rn9wr.pdf>). Finally, we examine how manipulating feelings of threat affects asymmetric zero-sum beliefs relative to a control condition in which threat is not manipulated (Study 6B). We predicted that feeling threatened would lead participants to believe that their colleagues succeed at their expense, but

**Figure 5**  
Zero-Sum Beliefs About U.S.–China Relations as a Function of Threat and Condition (China Gains vs. U.S. Gains; Study 5) (Error bars represent SEs)



not vice versa. In contrast, we predicted that when they do not feel threatened, participants would believe that their colleagues are equally prone to gain at their expense as they are prone to gain at their colleagues' expense.

## Study 6A

### Method

#### Participants

Based on the results of a pilot study, we aimed to recruit 100 participants (see preregistration). One hundred U.S. residents were recruited from Amazon's Mechanical Turk, and no participant was excluded from analyses ( $M_{\text{age}} = 37.23$ ; 34 female, 64 male, 2 other/prefer not to say; 78% White, 4% Black, 1% Hispanic, 9% East Asian, 1% South Asian, 7% Other). This sample size allows us to detect effects as small as  $\eta_p^2 = .039$  in a  $2 \times 2$  mixed-model ANOVA with 80% power.

#### Materials and Procedure

Participants imagined working at a company that was about to decide on upcoming promotions. They imagined that they and another colleague have been working at the company for an equal amount of time, have similar work performances, and are equally regarded in the company. Participants were further told that it was unclear how many promotions will be available, and that the company may choose to promote only one employee (i.e., zero-sum) or several employees at once (i.e., non-zero-sum).

We randomly assigned participants to one of two conditions, in which we manipulated whether they felt threatened by the promotion decision. In the *Threat condition*, participants read that their financial security relies on getting promoted. Specifically, they read that:

For the past couple of months, you have been behind on your mortgage payment. The bank has been calling you for several days, and you have been avoiding their calls. Getting this promotion would give you the financial stability that you need. You don't know what you'll do if you don't get this promotion.

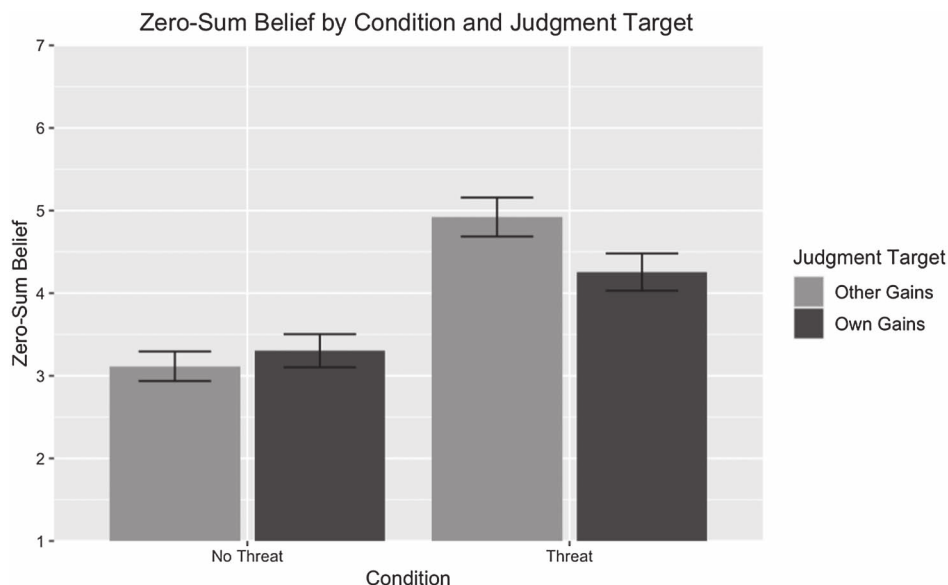
In the *No Threat condition*, participants read that the promotion is desirable, but that it would not change much for them. Specifically, they read that the promotion would only mean "a few added responsibilities and a fancy title" and that while they would be happy to get this promotion, they would "also be happy to stay" at their current position.

Next, participants reported how much their success would come at their colleague's expense and vice versa. Using two 4-item measures, participants indicated, in counterbalanced order, how their outcomes will affect their colleague's outcomes (e.g., "In this situation, my success would be [my colleague's] failure") and how their colleague's outcomes will affect their outcomes (e.g., "In this situation, [my colleague's] success would be my failure"); 1 = *Strongly disagree*, 7 = *Strongly agree*;  $\alpha > 0.95$ ; see Supplemental Materials). Finally, participants completed an attention check and indicated their age, gender, and race/ethnicity.

### Results

We predicted that participants would exhibit asymmetrical beliefs about their and their colleague's outcomes, but only when feeling threatened by the promotion decision. Indeed, a mixed-model ANOVA with condition (*Threat* vs. *No Threat*) as a between-participants factor and zero-sum judgment (*Own gains* vs. *Colleague's gains*) as a within-participants factor found a significant interaction,  $F(1, 98) = 14.51, p < .001, \eta_p^2 = .129$  (Figure 6). A series of planned contrasts revealed that participants in the *Threat condition* (who believed their financial security was hanging on the line) were

**Figure 6**  
Zero-Sum Beliefs About Workplace Promotions as a Function of Threat (*Threat* vs. *No Threat*) and Judgment Target (*Other Gains* vs. *Own Gains*; Study 6A) (Error bars represent SEs)



significantly more prone to believe that their colleague's success would come at their expense ( $M = 4.92, SD = 1.63$ ) than vice versa ( $M = 4.26, SD = 1.57$ ),  $t(98) = 4.12, p < .001$ . In contrast, participants in the *No Threat condition* (who imagined that not much was hanging on the line) were equally prone to believe that their colleague's success would come at their expense ( $M = 3.12, SD = 1.29$ ) as vice versa ( $M = 3.30, SD = 1.45$ ),  $t(98) = 1.20, p = .233$ . Thus, participants exhibited asymmetrical zero-sum beliefs only when they felt threatened by the looming promotion decision, viewing their colleague's success as coming at their expense, but not vice versa. In contrast, when they did not feel threatened, participants believed that they were as likely to gain at their colleague's expense as their colleague was to gain at their expense.

### Study 6B

Study 6B is a direct replication of Study 6A with the addition of a neutral control condition, where threat was not manipulated. We predicted that participants would be more prone to exhibit asymmetric zero-sum beliefs in the *Threat condition* than the *No Threat condition*. Although we did not have specific hypotheses regarding the *Control condition*, we expected it to feel substantially less threatening than the *Threat condition* and, as a result, that asymmetric zero-sum beliefs in it would be less pronounced. We did not have an a priori hypothesis regarding the comparison of the *Control condition* and the *No Threat condition*.

### Method

#### Participants

Based on the results of Study 6A, we aimed to recruit 200 participants. Two hundred U.S. residents were recruited from

Amazon's Mechanical Turk ( $M_{age} = 39.13$ ; 82 female, 118 male), allowing us to detect effects as small as  $\eta_p^2 = .038$  with 80% power.

### Materials and Procedure

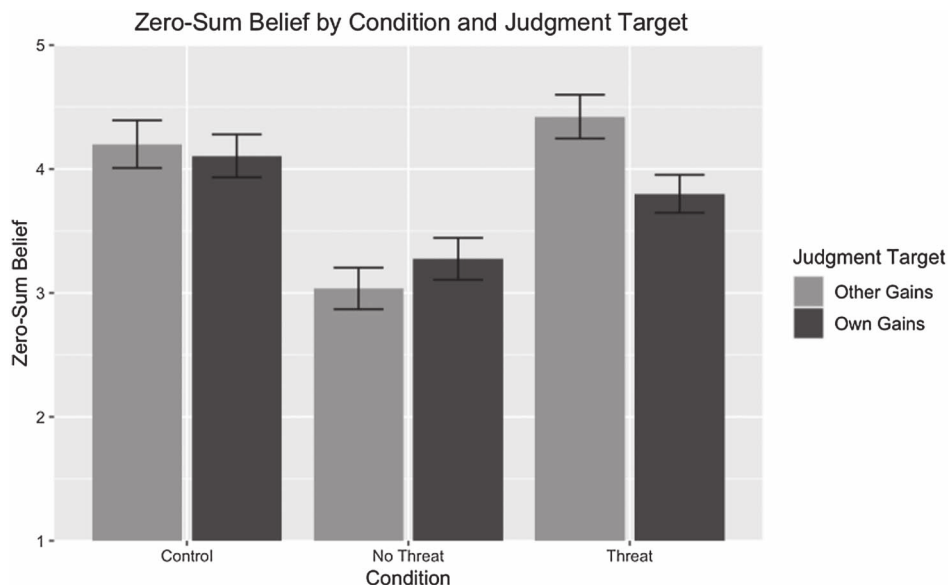
Participants read the same scenario from Study 6A, in which they imagined waiting to hear about an upcoming promotion decision and in which it was unclear how many promotions will be available, such that the company may choose to promote only one employee (i.e., zero-sum) or several employees at once (i.e., non-zero-sum).

We randomly assigned participants to one of three conditions. The two experimental conditions were identical to Study 6A, in which participants imagined their financial security depended on the promotion (*Threat condition*) or that not much was hanging on it (*No Threat condition*). In the *Control condition*, participants did not read anything about the promotion's implications. Then, using two 4-item measures, participants indicated how their outcomes will affect their colleague (e.g., "In this situation, my success would be [my colleague's] failure") and how their colleague's outcomes will affect them (e.g., "In this situation, [my colleague's] success would be my failure"); 1 = *Strongly disagree*, 7 = *Strongly agree*;  $\alpha_s > 0.79$ ; see Supplemental Materials. Finally, participants indicated their age, gender, and ideology.

### Results

As shown in Figure 7, a mixed-model ANOVA with condition (*Threat vs. No Threat vs. Control*) as a between-participants factor and zero-sum belief (*Own gains vs. Colleague's gains*) as a within-participants factor revealed a significant interaction,  $F(2, 197) = 14.75, p < .001, \eta_p^2 = .130$ . A series of planned contrasts revealed that participants in the *Threat condition* were significantly more prone to believe that their colleague's success would come at their expense ( $M = 4.42, SD = 1.42$ ) than vice versa ( $M = 3.80, SD = 1.24$ ),

**Figure 7**  
Zero-Sum Beliefs About Workplace Promotions as a Function of Threat (*Threat vs. No Threat vs. Control*) and Judgment Target (*Other Gains vs. Own Gains*; Study 6B) (Error bars represent SEs)





$t(197) = 5.44, p < .001$ . In contrast, participants in the *Control condition* (who did not receive any information about the promotion's implications) did not exhibit asymmetric zero-sum beliefs, believing that their colleague was as likely to gain at their expense ( $M = 4.19, SD = 1.56$ ) as they were to gain at their colleague's expense ( $M = 4.10, SD = 1.41$ ),  $t(197) = 0.83, p = .407$ . Finally, participants in the *No Threat condition* were slightly less likely to view their colleague's success as coming at their expense ( $M = 3.04, SD = 1.39$ ) as vice versa ( $M = 3.28, SD = 1.40$ ),  $t(197) = 2.15, p = .032$ . Thus, replicating Study 6A, only participants in the *Threat condition* believed that their colleagues succeed at their expense but that they do not succeed at their colleague's expense.

## Discussion

Replicating Study 5 in a new domain, Studies 6A and 6B found causal evidence for the role of threat in asymmetric zero-sum beliefs. Participants who felt threatened by a looming promotion decision believed that their colleagues succeed at their expense, but not vice versa. In contrast, participants who did not feel threatened by this decision believed that they were as likely to succeed at their colleagues' expense as their colleagues were to succeed at their expense. Notably, this threat was not due to participants' competitive disadvantage (i.e., whether they had better or worse odds of getting the promotion), but rather to the broader situation. Whereas a promotion decision that could substantially impact participants' finances led to asymmetric zero-sum beliefs, a similar decision with much lower stakes did not.

Interestingly, in addition to moderating asymmetric zero-sum beliefs, a lack of threat also decreased participants' overall level of zero-sum beliefs (i.e., a main effect of condition). This could be due to the belief that a personally inconsequential promotion is similarly inconsequential for one's colleagues, leading participants to view both their and their colleagues' success as non-zero-sum. If so, this may help explain why participants in the *No Threat* condition in Study 6B (who interpreted the promotion as largely inconsequential) exhibited overall lower zero-sum beliefs than participants in the *Control condition* (who may have viewed the promotion as still carrying some relevant consequences). Similarly, this can shed light on why participants in the *No Threat* conditions in Studies 6A and 6B viewed their own gains as less likely to come at others' expense than participants in the *Threat* conditions, suggesting that the former may have viewed the promotion as less consequential for their colleagues than the latter. Yet, regardless of these differences, that fact that participants exhibited asymmetric beliefs only when feeling threatened by a looming promotion decision suggests that threat causally increased such beliefs.

## General Discussion

Why do Americans believe that when China gains the U.S. loses but that when the U.S. gains, the whole world—including China—gains as well? Why do both Republicans and Democrats believe that the opposing party only benefits its own voters but that their own party's success benefits all voters regardless of political affiliation? And, why do negotiators so commonly believe that the other side is "out to get them" but that they themselves are merely trying to get the best possible deal that benefits all parties involved? In seven studies, we found robust and consistent evidence for *asymmetric*

*zero-sum beliefs*. Although situations involving two or more parties are either zero-sum or not, we found that people are ready to view them as both zero-sum *and* non-zero-sum, believing that other parties succeed at their expense, but that their own party does not succeed at others' expense. Moreover, we found that people exhibit asymmetric zero-sum beliefs when considering how their party relates to other parties but not when considering how other parties relate to each other. Finally, both correlational and causal evidence found that feeling threatened led to asymmetric zero-sum beliefs. The more participants felt threatened by an opposing country, political party, or work colleague, the more they viewed the other party's gains as coming at their expense. In contrast, feeling threatened did not affect beliefs regarding how much one's own gains come at others' expense.

## Theoretical Contributions for Understanding Zero-Sum Beliefs

Beyond documenting a novel asymmetry in beliefs about one's own and others' gains and losses, our findings make several important theoretical contributions to the literature on zero-sum beliefs. First, research on zero-sum beliefs has mostly focused on what specific groups believe about others' gains within threatening intergroup contexts (e.g., White Americans' attitudes about Black Americans' gains, men's attitudes about women's gains) or on what negotiators believe about their counterparts' gains within the context of a negotiation (which is typically rife with threat; e.g., Sinaceur et al., 2011; White et al., 2004). In doing so, research has examined zero-sum beliefs from only one perspective: how threatened parties view outgroup gains. Yet, as shown, those who feel most threatened are also most likely to exhibit zero-sum beliefs. By only examining the beliefs of those who feel threatened by others within the specific contexts in which they feel most threatened, the literature may have painted an incomplete picture of zero-sum beliefs that overlooks the possibility of *asymmetrical* beliefs. Our research expands this work by examining zero-sum beliefs in both threatening and nonthreatening contexts and by examining beliefs about one's own and others' gains, revealing that feeling threatened may be a necessary precursor for zero-sum beliefs.

Second, despite the variance in beliefs based on the specific contexts in which people find themselves, our research suggests that zero-sum beliefs may nonetheless share similar underlying processes in both interpersonal and intergroup contexts. Although zero-sum beliefs about trade, negotiations, partisan politics, and organizational hierarchies surely differ in many important ways, we find that they are nonetheless rooted in how threatened people feel by others' success, leading them to view other countries, negotiation counterparts, political parties, and colleagues as gaining at their expense, but not vice versa.

Third, although people differ in their general tendency to view social relations as zero-sum (Rózycka-Tran et al., 2015), our findings suggest that specific zero-sum beliefs about any two parties within a given situation are sensitive to egocentric perceptions of gains and losses and therefore depend on which party is seen as winning (or losing). Contemplating other parties' gains seems to activate zero-sum beliefs in a way that contemplating one's own gains does not.

This is not to say that people can not hold generalized zero-sum beliefs about "how the world works," but that such beliefs may not

necessarily predict people's views about a particular party's outcomes within a given situation. For example, rather than holding generalized zero-sum beliefs about the quantity of labor in an economy (i.e., the "lump of labor fallacy"), people may form specific beliefs about the availability of jobs on a case-by-case basis if and when they feel worried about immigration, globalization, automation, or any other source of threat. Similarly, regardless of their general beliefs about the complex implications of international trade, people likely form specific zero-sum beliefs about trade on a case-by-case basis when they feel threatened by other countries' success. As a result, this may help explain why people are prone to exhibit such zero-sum beliefs during economic downturns (i.e., when they feel economically threatened), but not during periods of economic growth (Sirola & Pitesa, 2017).

Fourth, the malleability of zero-sum beliefs in our studies suggests that these may function as a flexible tool for justifying gains and losses. For instance, Davidai and Ongis (2019) found that both conservatives and liberals exhibit zero-sum beliefs, but only when it benefits them to do so (e.g., conservatives view racial relations as zero-sum when considering minority, but not majority, gains). Moving beyond political identity, we find that this is not limited to political issues or to a need to justify or challenge the status-quo. Rather, the malleability of zero-sum beliefs seems to be due to the threat people feel by others' outcomes. Thus, beyond people's identity, asymmetric zero-sum beliefs reflect a broader psychological process that underlies the malleability of such beliefs. By attributing their failures to others' success, people may feel justified to recoup their losses and challenge others' gains as ill-gotten. In contrast, viewing one's gains as unrelated to others' outcomes (i.e., non-zero-sum) may shield people from an obligation to indemnify others for their lack of success. Consequently, this explains how people can view the same policy (e.g., trade tariffs) as both justified and unjustified, depending on whether it is put in place by their own country (e.g., when the U.S. imposes tariffs on Chinese imports) or by other countries (e.g., when China imposes similar tariffs on U.S. imports).

Of course, although feeling threatened moderates the tendency to view others as gaining at one's expense, viewing others' gains as coming at one's own expense may also cause people to feel threatened. Indeed, since a zero-sum mindset is believed to act as a "social axiom" that regulates interpersonal relations (Różycka-Tran et al., 2015), it follows that it would also lead people to feel generally threatened by others' success. After all, in a true zero-sum game, others' gains do entail losses to oneself and can therefore feel especially threatening. At the same time, our research shows that feeling threatened within a given context or relationship fosters more specific zero-sum beliefs about it. For instance, we found that feeling threatened by China leads Americans to view its gains as coming at the U.S. expense. Consequently, such zero-sum beliefs about China's success may lead Americans to feel even more threatened by it. Similarly, since negotiators who feel threatened by their counterparts view their gains as zero-sum, these beliefs may lead them to feel even more threatened by their counterparts. In this way, perceived threat and zero-sum beliefs can work together in a vicious circle, such that feeling threatened leads people to view others' gains (but not their own gains) as zero-sum which, consequently, may increase their initial feeling of threat. Thus, although our findings show that the causal chain between feeling threatened

and zero-sum beliefs can originate from threat, the relationship between the two may be bidirectional.

In addition to provoking threat, zero-sum beliefs may also arouse animosity toward those who seem to be gaining at one's expense. Although vigilance toward potential losses is clearly adaptive, viewing others as gaining at one's expense can stir up needless resentment, hostility, and aggression. And, since many seemingly zero-sum situations often have some potential for non-zero-sum gains (Fisher et al., 2011), seeing others gain at one's expense may lead people to overlook opportunities for mutual benefit and leave both parties worse-off than they could have been (Bazerman, 1983; Thompson & Hastie, 1990). This may be especially exacerbated by asymmetric zero-sum beliefs, which may lead people to view others as failing to reciprocate benefits they receive. As a result, such beliefs can undermine cooperation, such as when political leaders refuse to compromise on legislation they see as asymmetrically zero-sum.

Finally, just as threat amplifies asymmetric zero-sum beliefs, focusing on one's secure position seems to reduce them. Indeed, as shown in Studies 4–6, people who do not feel threatened exhibit *symmetrical* beliefs, viewing both parties as equally likely to gain (or lose) at each other's expense. More generally, people may exhibit symmetrical zero-sum beliefs in any unambiguously zero-sum situation. For example, poker tournaments, tennis matches, and budget allocations are all unambiguously zero-sum, and people may hold symmetric beliefs about their performance in them. At the same time, people may still exhibit asymmetrical beliefs even in such unambiguously zero-sum situations. Poker players may view their wins (but not their opponents' wins) as giving others an opportunity to become better players, tennis players may believe that spectators derive utility from seeing them (but not their opponents) win, mid-level managers may think that their division's success (but not other divisions' success) boosts the entire company's morale, and so forth. Thus, by viewing their success as carrying intangible benefits for others, people may still exhibit asymmetric beliefs even in unambiguously zero-sum situations, viewing others' gains—but not their own gains—as zero-sum.

## Limitations and Future Directions

Although we found robust evidence for asymmetrical zero-sum beliefs across different domains (international relations, interpersonal negotiations, politics, organizational hierarchies) and research designs (within- and between-participant), each individual study may have its own specific limitations. As mentioned above, although Study 1 examined asymmetric beliefs about international relations that have been somewhat politicized in recent years (a context in which such beliefs may be especially likely to arise), we also find that these beliefs are exhibited even when controlling for political ideology as well as in various nonpolitical, interpersonal contexts (Studies 2, 6A, and 6B). Similarly, although Study 5 manipulated threat in a non-zero-sum manner, this manipulation was nonetheless rooted in comparative advantage, a concern we addressed in Studies 6A and 6B by manipulating feelings of threat without invoking relative strengths or weaknesses. And, while Studies 5 and 6A did not include a control condition, we included such a condition in Study 6B, in which no threatening information was presented. Finally, although our research mainly focused on participants from the United States, generalized zero-sum beliefs have been

documented across various cultural contexts (e.g., Davidai & Ongis, 2019; Różycka-Tran et al., 2015), and we would therefore expect asymmetric beliefs to be exhibited beyond this specific culture. Thus, although the entire package of studies consistently documents asymmetrical zero-sum beliefs, each individual study may have its own specific limitations upon which future research could build and expand.

Future research could benefit from examining the extent to which zero-sum beliefs truly reflect “the endorsement that competition over resources is zero-sum” (Leviston et al., 2020). From a theoretical point of view, zero-sum situations are ones where the entirety of a party’s gains is offset by another party’s losses. Yet, people may not be so strict in their zero-sum beliefs, viewing any relationship as zero-sum so long as the involved parties’ outcomes are inversely (even if not perfectly) correlated. For instance, people who view U.S.–China relations as zero-sum probably do not believe that every \$1 earned in China necessarily means that the U.S. is now \$1 poorer. Instead, viewing U.S.–China relations as zero-sum suggests a belief that the two countries’ economic outlooks are negatively correlated, such that more wealth generated in China means less wealth generated in the U.S. And, since people think of gains and losses relative to reference points (Kahneman & Tversky, 1979), zero-sum beliefs likely reflect perceived changes in well-being—whether one party experienced positive change while another party experienced negative change—rather than a calculation of cumulative gains and losses. If so, this could explain why majority group members often view positive changes for historically underserved minorities as zero-sum, even when the minority group remains objectively worse-off (Brown & Jacoby-Senghor, 2021; Norton & Sommers, 2011). Thus, future research could examine how zero-sum beliefs relate to the perceived effect different parties have on each other (whether their outcomes are seen as inversely related) versus the distribution of resources itself.

Future research could also examine how zero-sum beliefs impact conflict resolution. As shown, people are more prone to zero-sum beliefs when thinking about others’ gains. Thus, rather than thinking about others’ gains, prompting people to think about their own gains may be effective in promoting cooperation and reducing conflict. For instance, when thinking about U.S.–China relations, prompting Americans to consider how they personally benefit from more affordable prices (rather than on how Chinese manufacturers benefit from increased revenues) may help reduce their zero-sum beliefs about trade and increase support for further trade initiatives. Second, since perceived threat moderates zero-sum beliefs, paying closer attention to whether people feel threatened (in addition to whether they are actually threatened) may be important in reducing such beliefs and curbing conflict behaviors. Just as participants in Study 5 who focused on U.S. strengths were less prone to view China as gaining at their expense, prompting people to consider their (and their party’s) advantages in any domain (e.g., having relatively higher charisma or better experience than a negotiation counterpart) should reduce their tendency to view others as gaining at their expense. Finally, given the role of zero-sum beliefs in expectations of conflict (Davidai et al., 2021), emphasizing the potential for joint gains (e.g., how issues such as climate change and global pandemics can be better tackled by stronger U.S.–China relations rather than by each country trying to tackle the issue separately) is clearly important to reducing interpersonal and intergroup conflict.

Additionally, although we find that people more readily interpret outgroup gains (vs. ingroup gains) as zero-sum, there may be contexts in which the opposite might be true. For instance, since some White Americans are threatened by the prospect of being seen as racist and feel guilty over past and present racial injustices (Leach et al., 2002), they might view White Americans’ gains as coming at the expense of people of color yet view Black Americans’ gains as non-zero-sum. At the same time, even if they view White Americans’ gains as zero-sum, it is unclear whether people who feel threatened by their own privilege view their own *personal* gains (rather than White Americans’ gains in general) as coming at others’ expense. Future research can examine these and other boundary conditions for asymmetric zero-sum beliefs.

Finally, although we examined a proximal causal explanation for asymmetric zero-sum beliefs—perceived threat—future research could benefit from examining more distal causes that lead people to feel threatened and therefore view others as gaining at their expense (but not vice versa). Indeed, in a survey of liberals’ and conservatives’ perceptions of political partisanship (Study S1 in the Supplemental Materials), we found that feeling threatened by the other side’s agenda was simultaneously and uniquely predicted (in a multiple regression analysis) by the ease with which participants could bring to mind instances when the other side’s gains just happened to coincide with their sides’ losses,  $\beta = 0.10$ ,  $t(199) = 1.95$ ,  $p = .052$ , and when the other side was treated better than their side,  $\beta = 0.11$ ,  $t(199) = 2.50$ ,  $p = .013$ , as well as the belief that the other side intentionally (rather than unintentionally) harms their side,  $\beta = 0.23$ ,  $t(199) = 5.14$ ,  $p < .001$ . Consequently, feeling threatened led participants to view the other side’s gains as zero-sum,  $\beta = 0.53$ ,  $t(201) = 12.31$ ,  $p < .001$ . Thus, although feeling threatened leads people to view a zero-sum relationship between their own and others’ outcomes, this feeling originates from how easily people can think of times when others happen to gain while they lose, times when others are treated better than themselves, as well as their belief that others’ gains intentionally harm them. Of course, these do not constitute an exhaustive list of all the situational and dispositional factors that may elicit feelings of threat, and we expect that any factor that leads people to experience threat in interpersonal and intergroup contexts will lead them to subsequently exhibit asymmetric zero-sum beliefs, viewing others as gaining at their expense but not vice versa.

## Conclusion

Whether, when, and why people view life as zero-sum is important for understanding (and hopefully mitigating) interpersonal, intergroup, and international conflicts. While truly zero-sum relationships necessitate that either party’s gains will lead to equivalent losses for the other party (and that is true regardless of which party gains and which party loses), we found that people often hold asymmetric zero-sum beliefs, viewing others’ gains as zero-sum, but their own gains as non-zero-sum. Moreover, we found that whether people exhibit such asymmetric zero-sum beliefs depends on how threatened they feel by others’ success. Reassuring people of their strengths, skills, and elevated status may be the first step to shifting them away from needless competition and toward more cooperative and mutually beneficial behaviors.



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