Thinking Structurally: A Cognitive Framework for Understanding How People Attribute Inequality to Structural Causes

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Abstract

To make accurate causal inferences about social group inequalities, people must consider *structural causes*. Structural causes are a distinct type of extrinsic cause—they are stable, interconnected societal forces that systematically advantage some social groups and disadvantage others. We propose a cognitive framework to specify how people attribute inequality to structural causes. This framework is rooted in counterfactual theories of causal judgment and suggests that people will recognize structural factors as causal when they are perceived as “difference-making” for inequality above and beyond any intrinsic causes. Building on this foundation, our framework makes the following contributions: First, we propose specific types of evidence that support difference-making inferences about structural factors, *within-group change* (i.e., the disadvantaged group’s outcomes improve under better societal conditions) and *between-group comparisons* (i.e., the advantaged group, who has similar baseline intrinsic traits to the disadvantaged group, experiences more favorable societal conditions and outcomes). Second, we consider contextual, cognitive, and motivational barriers that may complicate the availability and acceptance of this evidence. We conclude by exploring how the framework might be applied in future research on people’s causal inferences about inequality.

Keywords: inequality; causal attribution; structural causes

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Structural causes of inequality are stable, interconnected societal forces that systematically advantage some social groups and disadvantage others (Bonilla-Silva, 2015; Carmichael & Hamilton, 1967; Crenshaw, 1989; Haslanger, 2016; Hatzenbuehler, 2016; Jones, 1997; Rucker & Richeson, 2021; Salter et al., 2018). Research across the social sciences has documented how structural factors—which include societal institutions and cultural beliefs—contribute to inequalities in life outcomes between racial (Cooley et al., 2020; Hoffman et al., 2016; Lawrence & Mollborn, 2017; Pierson et al., 2020; Reece & O’Connell, 2016), gender (Bian et al., 2018; Cheryan et al., 2017; Herd et al., 2019; Leslie et al., 2015; Yavorsky et al., 2015), socioeconomic (Browman et al., 2019; Duncan et al., 2017; Kraus, Torrez, et al., 2019; Laurin et al., 2019; Phillips et al., 2020), and LGBTQ (Hatzenbuehler et al., 2010; Raifman et al., 2017) groups, and can be exacerbated at their intersections (Cole, 2009; Crenshaw, 1989; Henry et al., 2020; Lei & Rhodes, 2021; Purdie-Vaughns & Eibach, 2008; Sidanius et al., 2018).

Despite this fact, people often fail to acknowledge structural causes of inequality. Instead, many people favor intrinsic explanations that emphasize traits like ability or motivation (Cimpian & Salomon, 2014; Hunt, 2007; Kluegel & Smith, 1986; Mistry et al., 2012; Sigelman, 2012) or essentialist explanations that assume fixed innate differences between groups (Dar-Nimrod & Heine, 2011; Donovan, 2016; Panofsky et al., 2021). Although intrinsic factors may mediate structural influences, it is problematic to treat them as the sole root causes of inequality or as immutable properties (Cheryan et al., 2017; Donovan et al., 2019; Hetey & Eberhardt, 2018; Laurin et al., 2019; Rucker & Richeson, 2021; Spelke, 2005).

In addition to its importance for understanding human difference, recognizing structural influences has implications for how people reason about social policy and intervention.

Disregarding structural causes can lead to false conclusions, such as assuming that individuals are solely to blame for their disadvantage, or that societal interventions will have no effect for some groups (McCoy & Major, 2007; Piff et al., 2020; Rucker & Richeson, 2021; Soylu Yalcinkaya et al., 2017; Weiner et al., 2011).

Given the importance of acknowledging structural causes, a critical question becomes: How do people attribute inequality to structural causes? While research has focused on people's ignorance of or motivation to reject information about structural factors (Cimpian & Salomon, 2014; Jost, 2019; Rucker & Richeson, 2021), less work has detailed how people successfully make this causal link. In the present article, we present a cognitive framework, the *difference-making framework of structural causal attribution*, to describe this inferential process.

We organize the paper as follows. First, we describe the central issue: The causes of inequality are not readily apparent, and people can infer *different* causes, namely intrinsic or structural. Second, we outline our framework, which is rooted in counterfactual theories of causal judgment and posits that people infer structural causes if they perceive that structural factors were “difference-making” for inequality above and beyond any intrinsic causes. Third, we propose specific types of evidence that support structural causal attribution, and critically, contextual, cognitive, and motivational barriers to the availability and acceptance of this evidence. We conclude by outlining future research directions.

Making Sense of What Causes Inequality

People start noticing inequalities between social groups early in life (Rhodes & Baron, 2019; Santhanagopalan et al., 2022; Shutts, 2015). For example, by at least 5 to 7 years of age,

children are aware that White people tend to be wealthier than Black people (Elenbaas & Killen, 2016; Mandalaywala et al., 2020; Olson et al., 2012), that men tend to hold higher status occupations than women (Liben et al., 2001; Miller et al., 2018), and that people of high socioeconomic status tend to have more desirable possessions (Dore et al., 2018; Peretz-Lange et al., 2022).

However, even when people agree that there is inequality, they may still disagree about its *causes* (Hetey & Eberhardt, 2018; Mijs, 2018; Peretz-Lange et al., 2021; Vasilyeva et al., 2018; Vasilyeva & Lombrozo, 2020). For example, in judging why there are more men than women in the field of engineering, one person may favor structural causes that are extrinsic to the groups (e.g., men have more societal support than women to participate in the field), while another person may privilege intrinsic causes (e.g., men are inherently smarter than women at math; see Dennehy & Dasgupta, 2017 for discussion of various causal narratives). *Both* causal accounts explain why there would be systematic group differences, and people may differ in which account they find more compelling. Indeed, prior work has documented substantial variation in the extent to which children, adolescents, and adults endorse structural versus intrinsic causes of inequality (Bañales et al., 2020; Diemer et al., 2019; Flanagan et al., 2014; Godfrey et al., 2019; Kluegel, 1990; Mistry et al., 2016; Rizzo et al., 2021).

Structural Causes as a Unique Type of Extrinsic Cause

On its face, *structural causes* may seem synonymous with *extrinsic causes*—that is, any causes that are external to the individual. However, structural causes are a distinct type of extrinsic cause: they are stable, interconnected institutional practices and cultural beliefs that consistently advantage some groups and disadvantage others (Bonilla-Silva, 2015; Haslanger, 2016; Jones, 1997; Rucker & Richeson, 2021; Vasilyeva et al., 2018; Vasilyeva & Lombrozo,

2020). For example, the United States' GI Bill is a structural cause of racial wealth inequality because it was an institutional policy implemented in a way that consistently advantaged White Americans' ability to build wealth while disadvantaging Black Americans (Perea, 2015). In contrast, random adverse events, such as some natural disasters, are not structural causes but rather are merely extrinsic causes that are more evenly distributed across the population (see also "fatalistic causes"; Mistry et al., 2012, 2016).

The distinction between structural and merely extrinsic causes is nontrivial, as they constitute distinct patterns of reasoning (Hunt, 2002; Mistry et al., 2012; Weiss-Gal et al., 2009; Vasilyeva et al., 2021; Zucker & Weiner, 1993). For example, Vasilyeva et al. (2021) found empirical evidence that inferring structural, but not merely extrinsic causes, heightens the salience of social categories (e.g., gender) and leads reasoners to expect that inequality will persist over time. These causes also point to qualitatively different policy responses. Addressing a merely extrinsic cause of poverty in a neighborhood (e.g., an unexpected hurricane) would warrant a local intervention effort. In contrast, a structural cause, like discriminatory housing policies, indicates that deeper institutional changes are needed. Given that structural causes have distinct properties and downstream consequences for reasoning and intervention, we propose that a framework for describing structural causal attribution is needed.

Science of Inequality

Before we discuss structural causal attribution, we note that the science on the actual causes of inequality suggests that social group disparities are due to a complex interplay of structural and intrinsic factors. For example, structural constraints, such as fewer educational opportunities for lower-income children, can negatively impact their intrinsic motivation to succeed (Browman et al., 2019; Laurin et al., 2019), suggesting that structural barriers can affect

individual-level barriers to success (see also Lewis, 2016). At the same time, early and relatively minimal group differences may promote structural responses that reinforce and strengthen group distinctions (see, e.g., Wood & Eagly, 2002).

Despite this complexity, we discuss structural causes as independent from intrinsic causes for two reasons. First, this simpler conceptualization maps onto previous empirical work on people's causal beliefs about inequality, which has focused on their endorsement of structural *versus* intrinsic causes (Diemer et al., 2019; Rizzo et al., 2018; Vasilyeva et al., 2018; Vasilyeva & Lombrozo, 2020). Second, structural factors are typically less salient to people than intrinsic factors (Cimpian & Salomon, 2014; Rhodes & Mandalaywala, 2017), which motivates our focused analysis on how people successfully overcome barriers to structural thinking. That said, since our theoretical approach broadly applies to how people make causal inferences about inequality, it is *also* relevant for understanding intrinsic inferences.

A Difference-Making Theoretical Framework of Structural Causal Attribution

How do people successfully attribute inequality to structural causes? Across the psychology and education literature, the standard view is that people need to be made aware and accept that structural constraints exist (Cimpian & Salomon, 2014; Piff et al., 2020; Rucker & Richeson, 2021; Weisgram & Bigler, 2007). From an educational perspective, this standard approach would seek to increase people's awareness of the structural constraints that certain social groups face (e.g., Nelson et al., 2013), and also seek to reduce psychological threat that may prevent people from accepting this information (e.g., Adams et al., 2006).

We propose that the standard approach addresses a critical part of the structural inference problem, but does not address it entirely. Although people need to be aware of structural constraints in order to consider them as potential causes of inequality (especially historical

policies that have blatantly discriminated against certain groups; see Bonam et al., 2019; Nelson et al., 2013), this awareness does not always lead to causal *attribution*. In judging any outcome, people can consider a number of candidate variables, but identify some or even just one of the variables as the *actual* cause (Dweck & Leggett, 1988; Gilbert & Malone, 1995; Weiner, 1985). Consider this example from another domain: A student is trying to figure out why they failed a test. The student may be aware of many possible causes—their lack of preparation, poor skills, and an unfair test—but ultimately settle on their lack of preparation as being the actual cause.

Applying this logic to inequality, people could be made aware of and consider structural factors, but still privilege *intrinsic* factors as the cause of inequality (see Amemiya et al., 2021; Yang et al., 2021). Our framework seeks to address the second, critical part of structural inference: Once aware of structural constraints, what leads people to recognize them as *causal*? We propose that people must perceive that structural factors *made a difference* for inequality, above and beyond any intrinsic causes. We next describe the theoretical foundation for our framework: counterfactual theories of causal judgment.

Counterfactual theories of causal judgment. Counterfactual theories propose that people make causal judgments—i.e., *c* caused *e*—by comparing the known outcome, *e*, to a relevant alternative situation in which *c* had not occurred (Gerstenberg et al., 2021; Lewis, 1973; Mackie, 1974; Woodward, 2005). If the comparison reveals that the target variable is “difference-making”, such that the actual and counterfactual outcomes are different, people tend to endorse the variable as causal.¹ In order to generate the counterfactual outcome, people

¹ We note that there are additional approaches to causal judgment, such as *process theories* (Dowe, 2000; Shultz, 1982) and *associative theories* (Kruschke & Blair, 2000; Wasserman & Berglan, 1998), which emphasize features of *actual* events when making causal judgments. According to a process view, people consider the causal mechanism linking a candidate cause to the outcome (e.g., whether a physical quantity like momentum *transferred* from Ball A to Ball B). Associative theories posit that reasoners infer causality based on the strength of the association between two events (e.g., whether Ball A is present whenever Ball B passes through the gate). Despite their success in describing some aspects of causal cognition, these accounts do not capture the complexity of our intuitions that some causes “matter” while others do not (e.g., the chalk that is transferred from the cue stick to Ball A is not relevant for the ball’s movement).

intervene on the target variable, either through direct or simulated manipulation (Gerstenberg et al., 2021; Halpern & Hitchcock, 2015; Woodward, 2005). In our example above, the student may choose to study more for the next test to observe whether studying makes a difference for their performance. They may also rely on their prior knowledge that studying *typically* leads to better performance, and simulate the counterfactual that studying would have improved this particular test score (see Gerstenberg et al., 2021 for more on simulating counterfactuals).

There is robust evidence that people reason counterfactually to facilitate causal judgments about a range of domains including physical phenomena (e.g., Gerstenberg et al., 2017; Goddu & Gopnik, 2020; Sobel et al., 2004), common life events (e.g., Epstude & Roese, 2008), and critically, societal issues (e.g., Lagnado & Gerstenberg, 2017; Nolan, 2013; Sunstein, 2016; Wendell, 2020). For example, Sunstein (2016) notes that counterfactual claims are central to how people assess culpability in the law: When judges and juries assess whether someone was liable for an outcome (e.g., a car accident), they reason counterfactually about whether the outcome would still have occurred if the individual had acted differently (e.g., paid more attention to the road; see also Branscombe et al., 1996). Similarly, people use counterfactuals to make judgments about whether certain events or individuals had a causal impact on the course of history (Nolan, 2013; Sunstein, 2016; Wendell, 2020). In one illustrative study, adolescents were asked to reason about Adolf Hitler's importance for the Nazis' rise to power in Germany (Wendell, 2020). Notably, 82% of participants spontaneously generated at least one counterfactual statement when addressing this question, with some participants inferring that Hitler was indeed difference-making (e.g., "If it hadn't been for Hitler, the Nazis wouldn't have seized power"), while others rejected Hitler's importance because they believed that the outcome

would have happened anyway (e.g., “Someone else could have taken his role before Hitler formed history in the way he did”).

Application to structural causal attribution. Our framework contends that, similar to other domains of reasoning, people reason counterfactually to assess the causal role of structural factors on inequality (see Figure 1 for an overview of the framework). Here, the counterfactual question is: If the *societal structure* were different, would the level of inequality change? If people believe that removing societal constraints on disadvantaged groups would reduce inequality, they will recognize structural factors as causal. Consider the counterfactual comparison that journalist Isabel Wilkerson presents in her book, *Caste: The Origins of Our Discontent*, to argue for structural causes of racial inequality in life outcomes: “...on those cotton fields were opera singers, jazz musicians, playwrights, novelists, surgeons, attorneys, accountants, professors, journalists... We know that because that is what they and their children and now their grandchildren and even great-grandchildren have often chosen to become *once they had the chance to choose for themselves...*” (Wilkerson, 2020, emphasis added). Wilkerson’s argument rests on the counterfactual that Black Americans would have made significantly different life choices had they been granted greater societal opportunities.

Critically, however, people can be aware of structural factors but ultimately reason that they are *not* difference-making and that intrinsic factors are the main cause of inequality. For this to be the case, the counterfactual outcome should reveal that inequality does not change when the disadvantaged group is given greater opportunities. Ex-Google employee, James Damore, used such counterfactual evidence in his 2017 anti-diversity memo, entitled, “Google’s Ideological Echo Chamber.” He acknowledges sexism against women, but emphasizes that gender inequalities remain large across many societies, and even become greater in egalitarian societies

where women presumably have greater opportunities (see Vishkin, 2022, for a more nuanced interpretation of this phenomenon). Counterfactual reasoning is central to Damore’s causal reasoning, but he reaches an *intrinsic* account because his counterfactual comparison suggests that gender inequalities persist regardless of structural factors.

As demonstrated in these examples, perceptions of difference-making appear to be central to people’s structural attributions. Given that intervening on the target variable is a key part of this process (Gerstenberg et al., 2021; Halpern & Hitchcock, 2015; Woodward, 2005), it is important to specify how people “intervene” on structural factors, which are, by definition, complex and multifaceted. We posit that reasoners consider changes to *parts* of the social system (i.e., “soft interventions”; Eronen, 2020), and generalize these inferences to the broader societal structure. Indeed, people regularly build rich causal models of the world from the relatively sparse data that is available to them (Gopnik et al., 2004). In the next sections, we identify two types of evidence that serve as soft interventions on societal structures (we refer to this throughout the paper as “interventional evidence”; see Griffiths et al., 2008). We posit that this evidence may be most efficiently obtained in the context of formal education (e.g., social studies), but we also describe how people may encounter relevant instances in everyday life.

Evidence type 1: Within-group change. The first type of interventional evidence, *within-group change*, is the most conceptually straightforward, and was captured in Wilkerson’s (2020) comparison of Black Americans’ life outcomes. Specifically, if people observe the removal of a structural constraint (i.e., a soft intervention), followed by improvements in a disadvantaged group’s outcomes that narrow inequality between groups, they should infer that the constraint was difference-making. This counterfactual information reveals that the inequality is mutable and, critically, varies as a function of structural factors (see also Gopnik et al., 2017;

Heyman, 2009; Kelley, 1973). Within-group change also directly refutes essentialist explanations by showing that social groups' properties are not fixed, but responsive to the environment (Bastian & Haslam, 2006; Dar-Nimrod & Heine, 2011; Donovan et al., 2019).

The importance of learning about within-group change to infer structural causes aligns with a theoretical proposal from Hetey and Eberhardt (2018). The authors propose that Americans may accept structural causes of racial inequalities in the criminal justice system if they are informed that crime in Black communities decreases when “tough-on-crime” policies are reformed or abandoned (e.g., easing minimum sentencing laws). This idea is an example of within-group change (i.e., decreases in crime rates) in response to removal of the group's structural constraints (i.e., fairer laws and policing practices). Notably, children and adults spontaneously make the reverse prediction: When they construe group differences as being caused by societal factors, they *expect* to see within-group change across social environments (Noyes & Keil, 2020; Vasilyeva et al., 2018; Vasilyeva & Lombrozo, 2020).

Although people cannot directly observe within-group change on a large scale, they may observe changes in their own or others' outcomes to make inferences about groups. For example, a racially marginalized student may notice improvements in their own academic performance when they transition to a more supportive educational context (see also Gopnik et al., 2017; Seiver et al., 2013 for how people use this type of evidence when making causal judgments about individuals). In one study of Black college students attending Historically Black Colleges and Universities, a student made precisely this counterfactual inference, “The social aspect is completely different at Black colleges, which I'm very thankful for. I probably wouldn't have the grades I have [elsewhere]” (Palmer et al., 2010). People may use these individual observations to simulate the counterfactual outcome at the *group level*, for example, inferring that Black

Americans, as a group, are also likely to improve in their academic outcomes when provided with greater educational opportunities (see also Kubin et al., 2021; Piff et al., 2020 for the importance of personal experience when reasoning about societal issues).

Evidence type 2: Between-group comparison. Given that it may be challenging to observe the same group under different societal conditions (see Contextual Barriers section), people may turn to other evidence that informs the disadvantaged group's counterfactual outcome. We identify a second type of evidence, *between-group comparison*, which relies on the *advantaged group* who experiences fewer structural constraints as the counterfactual. The advantaged group offers insight into what may have happened for the disadvantaged group had they experienced the same favorable societal circumstances. To illustrate, when explaining women's underrepresentation in STEM, people may consider the career outcomes of *men*, who typically have greater societal support to participate in STEM. People may then reason that women's representation may look more like *men's* had women been given the same support. Notably, this logic is embedded in the standard educational approach to structural inference, which informs students about the different societal constraints that groups experience.

At least for *novel* inequalities, there is evidence that the standard approach of using between-group comparisons promotes structural attributions (Brown & Bigler, 2004; Rizzo et al., 2018; Vasilyeva et al., 2018; Vasilyeva & Lombrozo, 2020). In one illustrative study by Vasilyeva et al. (2018), children and adults were introduced to an unfamiliar inequality in which girls play the game "Green-Ball" much less frequently than boys. Participants were then presented with a between-group comparison in constraints: Girls' classrooms, but not boys' classrooms, had physical barriers to playing Green-Ball (i.e., girls' classrooms had a rule in which they had to throw a pebble into a *small* bucket to play, whereas boys' classrooms had a

larger bucket). This evidence led participants to explain the inequality in terms of girls' structural barriers to playing the game. Our framework posits that participants' structural attributions were supported by the fact that boys' outcomes (i.e., they played Green-Ball at higher rates) illustrated what would have happened if girls' environments afforded them opportunities to play Green-Ball.

To promote structural thinking about *well-known* inequalities, however, the standard between-group comparison approach needs to meet additional assumptions. Specifically, reasoners must perceive that the two groups are matched at baseline on all relevant *intrinsic* characteristics (e.g., abilities, motivation), such that the only meaningful difference between the groups is their societal constraints (for related theorizing see Hatzenbuehler, 2016; Lantz et al., 2021; Lu et al., 2020). This assumption is easily met for novel inequalities that reasoners have no prior beliefs about (e.g., gender differences in playing “Green-Ball”), but not for inequalities that are widely stereotyped as being intrinsically based (e.g., gender differences in playing with dolls and trucks). If reasoners believe the compared groups are intrinsically different, they may reason that structural constraints are only correlated with intrinsic differences and are not causal for inequality (see Amemiya et al., 2021). Compelling between-group comparisons thus rely on the compared groups being carefully matched at baseline (e.g., men and women with similar *baseline* interest and ability in STEM).

Can reasoners make compelling between-group comparisons in their everyday lives? We propose that it is possible to the extent that reasoners can compare individuals from different social groups with *similar* traits. Socially diverse contexts that allow contact with many individuals from different social groups may afford such comparisons. For example, students in racially diverse schools may notice that Black and White students who engage in the *same*

behaviors are treated differently by teachers (Yeager et al., 2017). As one Black adolescent observed, “I felt [my teacher] was being really racist to me because there was some White girl talking, and then I started talking, and then the teacher yelled at me” (Hope et al., 2015). After making these observations about individuals, reasoners may infer that groups also experience differential treatment that leads to inequality above and beyond any intrinsic differences.

Barriers to Structural Causal Evidence

Our framework has proposed two types of interventional evidence that can reliably promote structural thinking: within-group change and well-matched between-group comparisons. However, a theoretical framework should also account for why structural thinking is so rare (Cimpian & Salomon, 2014; Dunlea & Heiphetz, 2020; Hunt, 2007; Kluegel & Smith, 1986; Mistry et al., 2012). We contend that there are barriers to the availability and acceptance of both types of evidence. We consider contextual, cognitive, and motivational barriers in turn.

Contextual barriers. Social contexts generally limit people’s ability to observe within-group change and between-group comparisons, both in everyday life and across history. A major limitation to observing within-group change, which entails observing groups’ responses to *societal* changes, is that societal structures tend to be stable, rather than variable. Indeed, the societal institutions and cultural beliefs that contribute to inequality often persist across generations and settings (Bonilla-Silva, 2015; Haslanger, 2016; Hetey & Eberhardt, 2018). Two particularly salient examples are racial biases toward people of African descent and gendered societal roles for males and females. Moreover, largescale societal changes that *do* occur and the subsequent changes in inequality (e.g., America’s Great Migration; Wilkerson, 2010) may be forgotten over the course of history.

With respect to making compelling between-group comparisons, people must be in social contexts that are diverse enough to compare individuals who are from different social groups but have similar traits. The majority of people lack exposure to diverse social environments, particularly within the United States. Demography studies reveal high rates of segregation between social groups: For example, high-income American families tend to have low exposure to families from other socioeconomic backgrounds (Bischoff & Reardon, 2014; Reardon et al., 2018), and White American families often live in neighborhoods with other White individuals (Grigoryeva & Ruef, 2015). This issue may also come into play for gender: Even though most people have exposure to individuals of the opposite gender at home or at school, they may have few close relationships with differently-gender peers that would allow for insight into the other group's experiences (Maccoby & Jacklin, 1987; Mehta & Wilson, 2020).

Cognitive barriers. Our framework also suggests that there are cognitive barriers that can lead people to reject structural causal evidence, even when this information becomes available. As described in previous work, structural systems are complex and abstract, which may make structural information difficult to process (Cimpian & Salomon, 2014; Yang et al., 2021). This complexity may also explain why young children, who have relatively less knowledge about structural factors and limited cognitive resources to reason about such information, are especially unlikely to consider societal influences (Cimpian & Steinberg, 2014).

Critically, however, certain prior beliefs can impede structural inferences, even when the relevant evidence is presented in a way that is simple and accessible. In particular, pre-existing *essentialist* beliefs may lead people to reject both types of interventional evidence that we have identified. As noted earlier, if people believe that groups are intrinsically different, then between-group comparisons of structural constraints are confounded by these baseline differences. Thus,

someone with strong essentialist beliefs might reject a comparison between different groups' societal opportunities because they assume that one group cannot be used to make counterfactual judgments about the other. Moreover, even if the groups were matched on important potential confounds like interest and ability, essentialist beliefs may lead people to assume that deep, unobservable differences still exist between the groups, thus compromising any further comparison in their constraints.

Relative to between-group comparisons, essentialist beliefs may pose less of a challenge to evidence of within-group change, given that within-group change directly refutes essentialist ideas that groups' properties are fixed over time (Dar-Nimrod & Heine, 2011; Gelman, 2003). However, it is also possible that people with especially strong essentialist beliefs can accommodate within-group change in an essentialist framework. For example, people may assume that within-group change is *also* driven by intrinsic processes, such as groups' genes "evolving" differently (see Shtulman & Schulz, 2008 for related misunderstanding).

Motivational barriers. Motivated reasoning has been proposed as a key barrier to people's structural reasoning (Phillips & Lowery, 2018; Piff et al., 2020; Rucker & Richeson, 2021). Social psychological perspectives have highlighted people's persistent denial of structural causes, even after the causal link between structural factors and inequality is made obvious. This persistent denial is believed to stem from the psychological threat of structural explanations: They challenge many people's preferred belief that societal systems are fair and call into question the assumption that life successes are rooted in merit alone (Jost, 2019; Kraus, Onyeador, et al., 2019; Phillips & Lowery, 2018, 2020). This threat is likely to be greatest for members of advantaged groups whose positions in society are justified by intrinsic explanations (Cech & Blair-Loy, 2010; Cozzarelli et al., 2001; Hartmann et al., 2009; Nelson et al., 2013;

Panofsky et al., 2021; Phillips & Lowery, 2020) and to people with a social dominance orientation (i.e., a preference for social hierarchies; Pratto et al., 1994). Here, however, we take a step back in the inferential process to consider how motivations may affect whether people infer the causal link between structural factors and inequality in the first place. Our framework, which seeks to complement existing social psychological frameworks, proposes at least three mechanisms by which motivated reasoning affects the initial causal inference.

First, the type of counterfactual thinking needed to evaluate structural causes requires cognitive effort, in which people must represent actual inequality and then compare it to a counterfactual situation to determine if inequality would have been different (Byrne, 2016). Individuals who are satisfied with the status quo (e.g., members of advantaged groups) may be unmotivated to engage in this reasoning process. Indeed, people are less likely to ask counterfactual “what if” questions when they are satisfied with an outcome (Roese & Epstude, 2017), and they are less likely to search for causal explanations for outcomes that are familiar and pose no threat (e.g., Gendolla & Koller, 2001). Thus, some people may never seriously evaluate the causes of inequality, especially structural causes.

Second, even if people *do* engage in counterfactual reasoning to evaluate structural causes, they may strategically select or misrepresent counterfactual outcomes that support the conclusions they wish to make (see also Markman et al., 2008). As one relevant example, when asked to assess the United States’ progress toward racial equality, White Americans often used the *past* as the counterfactual reference point, which emphasizes the country’s progress, while racially minoritized people referenced *ideal* standards, which emphasizes the progress that has yet to be made (Eibach & Ehrlinger, 2006). Relatedly, recent work finds that White Americans resist accepting information indicating that this comparison is false (i.e., that the United States

has actually *not* made much progress toward racial equality from the past to the present; Onyeador et al., 2021).

A third mechanism is that people may strategically avoid certain situations that could influence the kinds of counterfactual comparisons they can make (see also Byrne, 2016; Hitchcock, 2011; Kahneman & Miller, 1986 for the variety of factors that influence the availability of counterfactuals). For example, people who are motivated to perceive the world as fair may avoid social contexts that could challenge this view (e.g., interacting with individuals outside of their racial group). Segregation from other groups may consequently limit the evidence available to make between-group comparisons of societal constraints (Merolla et al., 2011; Mijis, 2018). Overall, we propose that future work integrating social and cognitive psychological approaches could help inform how motivated reasoning impedes each part of the structural attribution process.

Additional Directions for Future Research

In addition to providing a cognitive theoretical framework for understanding structural thinking, our approach raises new questions for empirical research. We have discussed structural causes as a broad category, but an open question is whether some types of structural causes are more salient to people. We posit that people will be more accepting of structural causes that are *concrete and deterministic*, such as former policies at universities that completely forbade people of color and women from certain areas of study, compared to *abstract and probabilistic* structural causes, such as unwelcoming work environments where underrepresented groups are negatively stereotyped (Bian et al., 2018; Master et al., 2016). The more abstract and probabilistic the constraint, the more it is possible for people to reason that the disadvantaged group could have acted differently if they wanted to (e.g., the group could have persisted in

STEM despite a hostile work environment), thus reducing its perceived causal power (see Walker et al., 2015).

Further, one general challenge for counterfactual accounts is to specify the alternatives that people spontaneously consider (Hesslow, 1988). In some domains, people tend to consider the same counterfactuals (e.g., physical causation; Gerstenberg et al., 2017; see also Byrne, 2016). When reasoning about inequality, however, people may consider a much wider range of counterfactuals that serve various motivational and epistemic goals (Eibach & Ehrlinger, 2006; Kohler-Hausmann & Dembroff, 2022). For example, if people are interested in the effect of a specific policy, they may consider what happens to a disadvantaged group within the same societal context over time (e.g., changes in outcomes for American women under different social policies). But, if people are interested in the causal role of entire societal structures, they may care more about the group's outcomes across different societal contexts (e.g., comparing the outcomes for women living in different countries).

While we have largely focused on instances of within-group change for members of particular social groups (e.g., the changing life outcomes of “Black Americans”), it is also possible that learning how group *categories* themselves have changed over time would bolster structural thinking (e.g., the evolving conceptualizations of race and gender throughout history, see Dembroff, 2018; Spencer, 2019). Recognizing that social group categories are shaped by cultural conventions denaturalizes them, and in turn may reduce the essentialist beliefs that impede structural thinking. In support of this idea, a recent anti-essentialist educational intervention that incorporated information about the changing nature of racial categories reduced people's racial essentialism (Donovan et al., 2019).

There are also important questions regarding between-group comparisons. Here, we have focused on comparisons that hold intrinsic factors constant (e.g., interest and ability) to determine if structural factors are difference-making. However, people might also hold *structural constraints* constant to determine if groups' intrinsic properties are difference-making. Specifically, if groups have unequal outcomes despite similar structural constraints, people may assume that the inequality is caused by characteristics inherent to the group (Vasilyeva et al., 2018; Vasilyeva & Lombrozo, 2020; Yang et al., 2021). Of course, this raises questions about whether two groups' structural constraints are truly comparable. For example, scholars have argued that comparing Black Americans to other racial minority groups who also experience racial discrimination (e.g., Asian Americans), are unfair comparisons because Black Americans' societal oppression is qualitatively different (Godfrey et al., 2019; Lewis, 2016). However, we speculate that lay individuals may make such comparisons when they are available, even if they are invalid, when evaluating the causes of inequality.

Our framework may also inform current theorizing about belief polarization. Given the widespread segregation between social groups, it is likely that groups systematically differ in the evidence they observe, which may lead them to privilege different causes of inequality. Supporting this idea, a study by Jefferson and colleagues (2021) found that Black and White Americans made different inferences about the most likely cause for a police shooting of a Black civilian: Black Americans more strongly inferred structural causes (i.e., police racial bias) and White Americans more strongly inferred individual causes (e.g., the civilian may have attacked the officer). In line with our account, the authors proposed that this pattern may be due, in part, to differences in each group's exposure to racial bias in policing.

Finally, we note two important limitations that reflect broader limitations of the current psychological literature. First, we have drawn primarily from studies conducted in the United States (Cheon et al., 2020; Henrich et al., 2010), where one group (i.e., White Americans) possesses structural advantages in almost all aspects of society (e.g., economically, politically, numerically; Roberts & Rizzo, 2020). One interesting line of research would be to examine how people reason about inequality in societal contexts where structural advantages *vary* across groups. For example, in Indonesia, Native Indonesians are a numerical majority and are well-represented in the government, but have significantly less wealth than Chinese Indonesians (Brown et al., 2018). There may be even greater disagreement about structural attributions in such contexts where societal forces are impacting groups in different directions.

Second, while we have focused on inequalities between *individual* social groups (e.g., two racial groups), research on people's understanding of *intersecting* forms of societal oppression is critical (e.g., the unique forms of oppression that Black women experience; Cole, 2009; Crenshaw, 1989; Lei & Rhodes, 2021; Purdie-Vaughns & Eibach, 2008). An intersectional understanding requires more complex reasoning about inequality: Reasoners must be aware of the societal constraints that *subgroups* of people experience, and need to keep at least four groups in mind rather than just two (e.g., Black women, Black men, White women, and White men). Although more complicated, even young children and adolescents have intersectional *stereotypes* for various subgroups (Ghavami & Peplau, 2018; Jaxon et al., 2019; Lei et al., 2020), suggesting that people could also learn about intersectional forms of inequality.

Conclusion

There is strong interest in people's structural thinking about inequality, as it can be used to improve their understanding of human difference and their ability to make informed

judgments about societal policies (Donovan et al., 2019; McLoyd, 2019; Mijs, 2018; Mistry et al., 2012; Phillips & Lowery, 2018; Piff et al., 2020; Rucker & Richeson, 2021). Moving forward, however, we note an important caveat to consider: While inferring structural causes can reduce prejudice against disadvantaged groups, this is not always the case. Our argument is about inequality being reduced when structural constraints are *removed*. Yet some people may argue that inequality is reduced only when structural constraints are *added*, which could increase prejudice against minoritized groups. For example, believing that affirmative action policies discriminate against majority groups and is the only reason for increased representation of minoritized groups is a structural inference (Norton & Sommers, 2011), but one that reinforces negative ability stereotypes (Leslie et al., 2014). Thus, much like essentialist reasoning (see Peretz-Lange, 2021), structural thinking can both reduce and increase negative attitudes toward disadvantaged groups depending on the phenomenon being evaluated.

Here, we have focused on people's structural thinking about inequality, and have proposed a cognitive framework that identifies the specific evidence to support structural causal attributions, as well as the contextual, cognitive, and motivational barriers to this inferential process. This framework may help to offer a path to more accurate lay understanding of persistent social inequalities.

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Figure 1. Overview of the difference-making framework of structural causal attribution.