Social comparison for concern and action on climate change, racial injustice, and COVID-19

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Abstract
Preventing the negative impacts of major, intersectional social issues hinges on personal concern and willingness to take action. This research examines social comparison in the context of climate change, racial injustice, and COVID-19 during Fall 2020. Participants in a U.S. university sample (n = 288), reported personal levels of concern and action and estimated peers’ concern and action regarding these three issues. Participants estimated that they were more concerned than peers for all three issues and took more action than peers regarding COVID-19 and climate change. Participants who reported higher levels of personal concern also estimated that they took greater action than peers (relative to participants who reported lower levels of concern). Exploratory analyses found that perceived personal control over social issues were associated with greater concern and action for racial injustice and climate change but not for COVID-19. This indicates that issue-specific features, including perceived controllability, may drive people to differently assess their experiences of distinct social issues.
INTRODUCTION

The summer of 2020 was one of the most tumultuous periods in modern U.S. history. Racial justice protests made Black Lives Matter the largest movement in American history (Buchanan, Bui, & Patel, 2020). Simultaneously, there was climate destruction due to Hurricane Laura and the devastating California wildfires (World Meteorological Organization, 2020; Stelloh, 2020). Meanwhile, the novel COVID-19 virus brought illness and death to communities all over the United States (Centers for Disease Control and Prevention, 2021). Large-scale social issues such as these influence all members of a society but do so through different mechanisms and to varying extents. This leads to individual differences in the mental models that individuals use to guide their decision-making in the space. We posit that one’s issue-related attitudes and actions may be meaningfully influenced by comparison to others. Personal standing relative to peers may be a critical consideration for determining the importance of specific issues and how to respond to them (Ajzen, 1991; Gerrard et al., 2008; Pearson & Schuldt, 2015). Through interactions with peers, individuals can learn about an issue’s severity, discover concrete actions to take on it, and gauge their relative level of concern accordingly.

The present research examines the extent to which social comparisons regarding concern and action in the context of large-scale social issues are issue-general (i.e., people show the same pattern of comparison when relating self to peers across issues) or issue-specific (i.e., people show a different pattern of comparison for each issue). We examine how both beliefs about social norms and the presence of self-serving bias may influence this comparative process. We explored this question in the contexts of three of the most urgent social issues in recent years—climate change, racial injustice, and the COVID-19 pandemic. To our knowledge, this research is the first to examine social comparison both within and across these specific issues.

Individuals’ concerns and actions regarding any issue can be influenced by beliefs about social norms. For example, people tend to endorse the perceived attitudes of larger social groups regardless of their private opinions (Castelli, Tomelleri, & Zogmaister, 2008; Lerner & Tetlock, 1999). In a recent example, beliefs about public acceptance of gay marriage increased following its passage through the U.S. Supreme Court in 2015, yet private attitudes remained largely unchanged (Tankard & Paluck, 2017). Regarding action, individuals tend to follow the established behaviors of in-group members and engage in both unconscious and conscious behavioral mimicry (Chartrand & Bargh, 1999; Nolan et al., 2008). This mimicry of others extends to behavior involving large-scale social issues. In the context of climate change, individuals adopted environmental mitigation measures (e.g., increased their recycling, used less energy) when given information about the actions of others (Schultz, 1999; Bergquist, Nilsson, & Schultz, 2019; Schultz et al., 2007). Furthermore, one’s knowledge of an issue (Milfont, 2012) and its causes (Shi et al., 2016) can increase their concern and action intentions, and people tend to be more likely to accrue knowledge on an issue when it is a priority within their social group (Schuldt, Eiseman, & Hoffmann, 2020; Poortinga et al., 2019). Taken together, this suggests that individuals attend to and even mimic the concerns and actions of peers, including in the context of large-scale social issues.

Self-serving bias

Although peers can have a meaningful impact on attitude formation and behavior, self-serving bias, or the tendency to hold beliefs favoring the self over others (Alicke & Sedikides, 2009), may also inform personal attitudes and actions on large-scale social issues. Self-serving bias is
Social comparison and issue-specific considerations

Distinct patterns of social comparison may arise due to perceived issue-specific differences. The issues examined here differ meaningfully in myriad ways (e.g., the number of people affected at any moment, the nature of the negative outcomes, the extent to which the threat posed by the issue is perceived as novel or entrenched). One area where these three issues may differ is in perceived pervasiveness in both subjective (e.g., relationship satisfaction) and objective domains (e.g., memory performance) (Buunk, Oldersma, & deDreu, 2001; Schmidt, Berg, & Deelman, 1999). It is possible that self-serving bias may present an obstacle when it comes to implementing large-scale social change. Individuals tend to exhibit self-serving bias in the moral domain, believing (inaccurately) that they are more morally inclined than peers and more likely to engage in prosocial action (Epley & Dunning, 2000). Given the moral implications of harm caused by the social issues examined in the present research (climate change, racial injustice, and COVID-19), we hypothesized that individuals may overestimate their concern levels and subsequent action in these areas relative to peers.

Unfortunately, it is exactly this type of issue—which requires collective action to facilitate change—where having self-serving biases might be especially detrimental. In particular, self-serving bias may impede the translation of concern to action. Many important social issues suffer from an “attitude-behavior gap,” or a discrepancy between attitude strength and associated action (Albarracin & Shavitt, 2018). For example, in the context of climate change, people’s actions often fall short of what their stated concern level would imply (Carrington, Neville, & Whitwell, 2014). Self-serving biases have the potential to widen this gap if people inaccurately believe that they are more concerned about an issue and take greater action than their peers to address it.

As an example, a person may believe they are more concerned about the environment and thus take more actions motivated by this concern (e.g., recycling more) than their average peer. However, it is difficult to accurately assess both where one stands relative to others on internal factors (e.g., personal concern) and the effectiveness of individual action regarding issues with multiple avenues to solution. For instance, recycling has a relatively low impact compared to other actions one can take to mitigate their carbon footprint (e.g., reducing air travel; Environmental Protection Agency, 2020; Calderon-Tellez & Herrera, 2021). However, if a person overestimates both their level of personal concern and the effectiveness of their actions relative to their peers, they may be satisfied with relatively less effective action. Furthermore, self-serving bias might obscure personal responsibility if individuals think they take more action than peers and thus determine they have done “enough” (Karau & Williams, 1993). It is possible that accurate social comparison could provide a helpful benchmark for individuals to gauge and set their own levels of concern and action, but the usefulness of this benchmark may be distorted by widespread self-serving bias.

Alternatively, individuals may have more accurate normative information about large-scale issues such as the ones examined here relative to the domains that have been studied previously in the literature. The visibility of large-scale social issues might prompt individuals to share their attitudes and behaviors through discussion and social media (Anderson, 2017; Bonilla & Rosa, 2015). In these cases, individuals may have more accurate perceptions of group-level norms and their relative standings compared to the more internal domains where self-serving bias has been previously identified (e.g., driving, ethical behavior, relationship satisfaction). It is thus possible that these externally-focused issues may be characterized by relatively low levels of self-serving bias.
controllability, or the extent to which an individual feels they can control their personal exposure and contribution to risks posed by the issue. We hypothesize that perceived controllability will be associated with issue-specific differences, such that when an issue is perceived to be more controllable, it will garner greater individual concern and action.

That said, all three issues are highly intersectional. For example, racial inequity touches all spheres of American society from health to economics (Roberts & Rizzo, 2021), resulting in minority communities experiencing disproportionate COVID-19 cases and deaths (Paradies, 2006; Mahajan & Larkins-Pettigrew, 2020) and an increased likelihood of residence in unfavorable environmental conditions (Gochfeld & Burger, 2011). In addition, COVID-19 mortality rates are worsened by air pollution (Wu et al., 2020). It is possible that this intersectionality may make these issues highly correlated in people’s minds, resulting in relatively similar levels of concern and reported action across issues.

**Hypotheses**

The present study is uniquely positioned to illuminate the dynamics of social comparison regarding climate change, racial injustice, and COVID-19 at a moment when these issues were particularly salient (October 2020). Our three interrelated hypotheses are both exploratory and preregistered:

- **H1 (exploratory)**: Regarding concern, we predicted that participants would estimate that peers were less concerned about all three social issues than they personally were (e.g., would demonstrate self-serving bias).
- **H2 (exploratory)**: Regarding action, we predicted that participants would estimate that peers took less action than they personally took on all three social issues.
- **H3 (preregistered)**: Bridging concern, action, and social comparison, we predicted that when participants were relatively more concerned about an issue, they would estimate having taken more action than their peers.

**Controllability analysis (exploratory)**: Finally, we conducted an exploratory post hoc analysis to test whether perceived controllability was differentially related to personal concern and action for climate change, racial injustice, and COVID-19.

**METHOD**

**Participants**

Data were collected from individuals affiliated with a large university in the northeastern United States as a part of a broader longitudinal study on the effects of the COVID-19-related university
shutdown. This study \((n = 288; \, M_{\text{age}} = 27.7, \, SD_{\text{age}} = 12.6, \, \text{age range} = 18–75)\) is a subsample of a larger, within-subjects project (see Supplemental Materials \(^1\)). All participants gave their consent to participate in the baseline wave of the study in March 2020 in accordance with the university’s Institutional Review Board. The larger project examined how the COVID-19 pandemic impacted physical and mental health over time (March 2020–October 2020) in a neurotypical university sample. Additional measures were collected by multiple participating labs and will not be discussed further, as they are not relevant to the current research question and are themselves under development for separate projects. As part of this larger longitudinal project, the sample size was dependent upon initial list-serv recruitment (i.e., baseline wave) and continued participation (i.e., follow-up waves) rather than an a priori power analysis.

The subsample examined in the present research consists of individuals who completed the sixth wave of data collection in October 2020. The difference in sample size from baseline reflects attrition over the study duration. This wave selection was necessary, as we measured attitudes and actions regarding racial injustice at later waves than at baseline, given that the large-scale Black Lives Matter protests did not occur until months after baseline wave collection. All three issues were differentially present in the national eye over the full duration of the study (March–October 2020), with COVID-19 case fluctuations (Centers for Disease Control and Prevention, 2021), racial justice protests (Hill et al., 2020), and environmental disasters (N.O.A.A. National Centers for Environmental Information, 2021) occurring sporadically during that time. It is also worth noting that, following a brief in-person start of classes from August 24 to September 3, 2020, the university moved all activities online for the rest of the Fall 2020 semester to prevent the spread of COVID-19. This means that, although students had the option to live in a range of housing options (e.g., near campus, permanent residence), at the time of data collection, university operations were entirely remote and online. As a result, participants’ responses were not influenced by any in-person university activities nor university-wide pandemic-related protocols (e.g., mask mandates) on campus during the period of data collection (October 19–23, 2020) or the several weeks prior. The measures included in this study were all collected in the sixth wave (late October 2020) aside from demographics (collected at baseline, March 2020). Detailed demographics (Table 1) are reported to provide transparency regarding the generalizability of our results (Roberts et al., 2020).

**Materials**

All participants who responded to each relevant measure were included in each analysis using that measure to retain as many observations as possible (Lavrakas, 2008). All analyses are within-subjects (see Table 2 and Supplemental Materials \(^1\) for further measurement information). In peer estimation questions, we asked participants to make inferences for their average peer, as opposed to giving specific direction regarding the type of peer they should consider. This framing is used in existing work examining social comparisons (Epley & Dunning, 2006) and avoids the potential influence of individual (e.g., selection of peers more or less concerned about social issues) and interpersonal (e.g., closeness) differences on the appraisal of others’ behavior (Kelley, 1973). All code, deidentified data, supplemental analyses, and measures are publicly available1. For all variables, ratings were made on a response scale from 0 = “Not at all” to 6 = “Extremely frequently”.
TABLE 1  Participant demographics

| Self-reported demographics                      | Total number of participants reporting (percentage of total) |
|-------------------------------------------------|-----------------------------------------------------------|
| **Gender identity**                             |                                                            |
| Female                                          | 227 (78.82%)                                               |
| Male                                            | 49 (17.01%)                                                |
| Nonbinary                                       | 6 (2.08%)                                                  |
| Another gender or prefer not to respond         | 6 (2.08%)                                                  |
| **Racial and ethnic identity**                  |                                                            |
| Latinx or Hispanic                              | 18 (5.64%)                                                 |
| Caucasian                                       | 226 (70.85%)                                               |
| Black                                           | 23 (7.21%)                                                 |
| Indigenous American                             | 4 (1.25%)                                                  |
| Asian                                           | 41 (12.85%)                                                |
| Race or ethnicity not listed                    | 7 (2.19%)                                                  |
| **Position in university**                      |                                                            |
| Undergraduate Student                           | 161 (52.78%)                                               |
| Graduate student                                | 66 (21.64%)                                                |
| Faculty                                         | 26 (8.52%)                                                 |
| Staff                                           | 46 (15.08%)                                                |
| Other position                                  | 6 (1.97%)                                                  |
| No response                                     | 0 (0%)                                                     |
| **Political party affiliation**                 |                                                            |
| Democratic Party                                | 192 (66.67%)                                               |
| Republican Party                                | 20 (6.94%)                                                 |
| Independent                                     | 33 (11.46%)                                                |
| Other                                           | 6 (2.08%)                                                  |
| No response                                     | 37 (12.85%)                                                |
| **Mean age (SD)**                               |                                                            |
| Total sample                                     | 27.7 (12.6)                                                |
| Undergraduate student                           | 20.6 (4.23)                                                |
| Graduate student                                | 30.9 (8.61)                                                |
| Faculty                                         | 53.8 (12.4)                                                |
| Staff                                           | 38.6 (14.2)                                                |
| Total participants                              | 288 (100%)                                                 |

*Note:* a Thirty-one participants in wave 6 identified with more than one racial or ethnic identity. These participants are included in all racial and ethnic groups that they reported. Percentages reflect percentages of all racial and ethnic identities reported.

b Forty-five participants chose not to report their ages (18 undergraduate students, six graduate students, nine faculty, and 13 staff).
| Variable | Variable information |
|----------|----------------------|
| **Personal concern** | In the past 2 weeks, how often did you worry about COVID-19/racial injustice/climate change? (scale: 0 (least) - 6 (most)) |
| **Descriptive Statistic** | Climate Change | COVID-19 | Racial Injustice |
| Total number of participants ($n$) responding (percentage of total) | 237 (82.3) | 275 (95.5) | 262 (90.97) |
| Mean (SD) | 2.66 (1.79) | 3.09 (1.67) | 3.59 (1.81) |
| $n$ included in H1 analysis (percentage of wave 6) | 235 (81.6) | 235 (81.6) | 235 (81.6) |
| Mean (SD), H1 | 2.66 (1.79) | 3.11 (1.66) | 3.55 (1.83) |
| **Estimated peer concern** | In the past 2 weeks, how often do you estimate your average peer worried about COVID-19/racial injustice/climate change? (scale: 0 (least) - 6 (most)) |
| **Descriptive Statistic** | Climate Change | COVID-19 | Racial Injustice |
| Total number of participants responding (percentage of total) | 237 (82.3) | 274 (95.14) | 264 (91.7) |
| Mean (SD), All | 2.37 (1.45) | 2.95 (1.33) | 3.29 (1.61) |
| $n$ included in H1 analysis (percentage of wave 6) | 235 (81.6) | 235 (81.6) | 235 (81.6) |
| Mean (SD), H1 | 2.38 (1.42) | 2.86 (1.33) | 3.17 (1.57) |
| **Personal action** | In the past 2 weeks, how much action have you taken to reduce the spread of COVID-19/racial injustice/climate change? (scale: 0 (least) - 6 (most)) |
| **Descriptive Statistic** | Climate Change | COVID-19 | Racial Injustice |
| Total number of participants responding (percentage of total) | 238 (82.6) | 274 (95.14) | 263 (91.34) |
| Mean (SD), All | 2.2 (1.57) | 4.46 (1.33) | 2.9 (1.6) |
| $n$ included in H2 analysis (percentage of wave 6) | 234 (81.25) | 234 (81.25) | 234 (81.25) |
| Mean (SD), H2 | 2.22 (1.57) | 4.5 (1.34) | 2.83 (1.6) |
**TABLE 2 (Continued)**

| Variable               | Variable information                                                                                                                                                                                                 |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Estimated peer action  | In the past 2 weeks, how much action do you estimate your average peer has taken to reduce the spread of COVID-19/racial injustice/climate change? (scale: 0 (least) - 6 (most))                                      |
| Descriptive Statistic  | Climate Change | COVID-19 | Racial Injustice |
| Total number of participants responding (percentage of total) | 236 (81.94) | 273 (94.8) | 263 (91.34) |
| Mean (SD)              | 2.02 (1.28) | 3.13 (1.28) | 2.79 (1.3) |
| n included in H2 analysis (percentage of wave 6) | 234 (81.25) | 234 (81.25) | 234 (81.25) |
| Mean (SD), H2          | 2.01 (1.29) | 3.09 (1.31) | 2.74 (1.28) |
| Controllability        | In the past 2 weeks, I felt like I had control over my contribution to climate change/racial injustice/becoming infected with COVID-19 (scale: 0 (least) – 6 (most))                                               |
| Descriptive Statistic  | Climate Change | COVID-19 | Racial Injustice |
| Total number of participants responding (percentage of total) | 233 (80.9) | 233 (80.9) | 233 (80.9) |
| Mean (SD)              | 1.86 (1.59) | 2.72 (1.59) | 2.76 (1.87) |
| n included in exploratory analysis (percentage of wave 6) | 233 (80.9) | 233 (80.9) | 233 (80.9) |
| Mean (SD), exploratory controllability analysis | 1.85 (1.58) | 2.76 (1.59) | 2.77 (1.84) |

**Concern for climate change, racial injustice, and COVID-19**

**Personal concern**

Participants were asked how often they worried about each social issue over the past 2 weeks (Table 2).

**Estimated average peer concern**

Participants were asked to estimate how often their average peer worried about each social issue in the past 2 weeks.
Actions for climate change, racial injustice, and COVID-19

Personal action

Participants were asked how much action they had taken to mitigate each distinct issue in the past 2 weeks.

Estimated average peer action

Participants were asked to estimate how much action their average peer had taken to mitigate each distinct issue in the past 2 weeks.

Exploratory measure: Controllability

Controllability

Participants were asked to indicate the extent to which they felt they had control over their contributions to each social issue (e.g., sense of personal responsibility over their impact related to each issue) over the preceding 2 weeks.

ANALYSIS & RESULTS

Concern regarding climate change, racial injustice, and COVID-19

**H1. Social comparison:** participants underestimated peers’ concern for climate change, racial injustice, and COVID-19 relative to their own.

Using a 2 (target: self, estimated peer) × 3 (issue: climate change, racial injustice, COVID-19) repeated-measures ANOVA on concern, with an error term of participant, we did not find a significant interaction between issue and target on concern, $F(2, 468) = 0.517, p = .6, \eta^2_p = 0.002, 95\% CI [0, 0.01]$. Using a main effects model, we found main effects of both issue, $F(2, 468) = 37.31, p < .001, \eta^2_p = 0.14, 95\% CI [0.08, 0.19]$, and target, $F(1, 234) = 13.28, p < .001, \eta^2_p = 0.05, 95\% CI [0.01, 0.12]$, aligning with our predictions.

Follow-up paired $t$ tests (Bonferroni-corrected) showed that participants thought peers ($M = 2.86, SD = 1.33$) were less concerned about COVID-19 than the self ($M = 3.11, SD = 1.66$), $t(234) = 2.15, p = .03, d = 0.14, 95\% CI [0.01, 0.27]$ (Figure 1). Participants also estimated that peers were less concerned than they personally were regarding climate change (personal: $M = 2.66, SD = 1.79$; estimated peer: $M = 2.38, SD = 1.42$), $t(234) = 2.53, p = .012, d = 0.17, 95\% CI [0.04, 0.29]$ and racial injustice (personal: $M = 3.55, SD = 1.83$; estimated peer: $M = 3.17, SD = 1.57$), $t(234) = 3.22, p = .001, d = 0.21, 95\% CI [0.08, 0.34]$ (Table 2).

**Issue-specific differences:** individuals reported being most concerned about racial injustice, COVID-19, and climate change (in that order) and estimated the same for their peers. We found that concern varied by issue across both target types (i.e., self, estimated peer). Participants were more concerned about racial injustice than about climate change, $t(234) = 7.19, p < .001, d = 0.47,$
FIGURE 1  Participants estimated that they were significantly more concerned than peers were about climate change, racial injustice, and COVID-19. Stars denote significant self-estimated peer differences.

95% CI [0.33, 0.6], more concerned about COVID-19 than about climate change, $t(234) = 3.64, p < .001, d = 0.24, 95\% \text{CI} [0.1, 0.37]$, and more concerned about racial injustice than about COVID-19, $t(234) = 3.52, p < .001, d = 0.23, 95\% \text{CI} [0.1, 0.36]$. Participants also estimated that peers were more concerned about racial injustice than COVID-19, $t(234) = 2.68, p = .008, d = 0.17, 95\% \text{CI} [0.05, 0.3]$ and that peers were more concerned about COVID-19, $t(234) = 3.99, p < .001, d = 0.26$, 95% CI [0.13, 0.39] and racial injustice, $t(234) = 7.5, p < .001, d = 0.48$, 95% CI [0.34, 0.61] than about climate change (Figure 1).

**Action regarding climate change, racial injustice, and COVID-19**

**H2. Social comparison:** individuals believed they took more actions to mitigate COVID-19 and climate change than their peers.

Using a 2 (target: self, estimated peer) \times 3 (issue: climate change, racial injustice, COVID-19) repeated-measures ANOVA on action, with an error term of participant, we found an interaction between issue and target on estimated action, $F(2, 466) = 87.41, p < .001, \eta_p^2 = 0.27, 95\% \text{CI} [0.21, 0.33]$.

Follow-up paired $t$ tests (Bonferroni-corrected) showed that participants estimated that they took more action on climate change ($M = 2.22, SD = 1.57$) than their peers ($M = 2.01, SD = 1.29$), $t(233) = 2.51, p = .013, d = 0.16, 95\% \text{CI} [0.03, 0.29]$. Participants also estimated that they took more action ($M = 4.5, SD = 1.34$) than their peers did ($M = 3.09, SD = 1.31$), $t(233) = 14.43, p < .001, d = 0.94, 95\% \text{CI} [0.79, 1.1]$ on COVID-19 (Figure 2). Despite greater estimations of personal than peer concern, participants estimated similar levels of peer action ($M = 2.74, SD = 1.28$) and personal action ($M = 2.83, SD = 1.6$) for racial injustice, $t(233) = 1.07, p = .29, d = 0.07, 95\% \text{CI} [-0.06, 0.2]$ (Table 2).
FIGURE 2  Estimated peer and personal action did not significantly differ for racial injustice, but participants estimated that peers take significantly less action on climate change and COVID-19 than themselves. Stars denote significant self-estimated peer differences.

**Issue-specific differences**: individuals reported taking the most action on COVID-19, racial injustice, and climate change (in that order) and believed the same was true for their peers. Participants reported taking the most action on COVID-19 relative to the other two issues: they indicated they personally took more action on COVID-19 than racial injustice, $t(233) = 14.36, p <.001, d = 0.94, 95\% \text{ CI} [0.78, 1.1]$, and they reported taking more action on racial injustice, $t(233) = 5.76, p <.001, d = 0.38, 95\% \text{ CI} [0.24, 0.51]$, and COVID-19, $t(233) = 19.01, p <.001, d = 1.24, 95\% \text{ CI} [1.07, 1.41]$, than climate change. Similarly, participants estimated peers took the most action on COVID-19 relative to the other two issues: they estimated peers took more action on COVID-19 than racial injustice, $t(233) = 3.24, p =.001, d = 0.21, 95\% \text{ CI} [0.08, 0.34]$, and they estimated that peers took more action on racial injustice, $t(233) = 7.99, p <.001, d = 0.52, 95\% \text{ CI} [0.39, 0.66]$, and COVID-19, $t(233) = 9.03, p <.001, d = 0.59, 95\% \text{ CI} [0.45, 0.73]$, than climate change.

The concern-action gap in social comparison

**H3.** Participants estimated taking greater action than peers when they were more concerned about an issue.

To examine how personal concern was associated with self-other asymmetry in action, we estimated a multilevel model (via “lme4”; Kuznetsova, Brockhoff, & Christensen, 2017) in R, with fixed effects of personal concern (standardized), issue, and their interaction predicting difference in self-estimated peer action (standardized) and a random effect (i.e., varying-intercept) of participant. The “difference in personal-estimated peer action” variable was a difference score with estimated peer action subtracted from personal action within each issue per participant. The resulting variable ranged from 6 (indicating that participants felt they were doing the most action and peers were doing the least) to -6 (vice versa).
FIGURE 3 Participants estimated that they took significantly more action than peers on all three social issues when they were more concerned about the issue. Note. Error ribbons denote standard error. The y-axis represents the difference score between estimated action taken by the self and estimated action taken by the peer per issue, such that higher scores (over zero) indicate that a participant estimates they take greater action than their peers, and lower scores (under zero) indicate that a participant estimates that peers take greater action than themselves.

As predicted, concern impacted perceived differences in personal vs. peer action levels for all social issues. We did not find evidence for a concern × issue (climate change, racial injustice, COVID-19) interaction in our multilevel model when examining self-peer differences in action predicted by concern for climate change, \( b = 0.07, se = 0.08, t(581.86) = 0.9, p = .37 \), or racial injustice, \( b = 0.03, se = 0.08, t(583.42) = 0.46, p = .65 \), compared to COVID-19, or climate change compared to racial injustice, \( b = 0.1, se = 0.07, t(571.96) = 1.4, p = .16 \) (interaction: issue × concern \( \eta_p^2 = 0.004, 95\% CI [0, 0.02] \)). We tested a main effects model on concern and issue (AIC = 1729.3, BIC = 1756.6) and found that it had better model fit than the interaction model (AIC = 1731.2, BIC = 1767.6), \( \chi^2(2) = 2.09, p = .35 \). The main effects model also better predicted self-estimated peer action relative to the null model (i.e., one with only random effects for participant, AIC = 1983.6, BIC = 1997.3, \( \chi^2(3) = 260.35, p < .001 \)). With the main effects model, we found a main effect of concern, \( b = 0.37, se = 0.03, t(641.48) = 11.07, p < .001, \eta_p^2 = 0.16, 95\% CI [0.11, 0.21] \), such that participants at greater levels of concern believed they took more action than their peers across all issues (Figure 3).

We also found a main effect of issue (\( \eta_p^2 = 0.3, 95\% CI [0.24, 0.36] \)) such that individuals estimated they took greater action than their peers across all levels of concern for COVID-19 compared to racial injustice, \( b = 0.96, se = 0.07, t(471.04) = 13.74, p < .001 \), and climate change, \( b = 0.71, se = 0.07, t(471.04) = 10.1, p < .001 \), and greater action than peers for climate change compared to racial injustice, \( b = 0.25, se = 0.07, t(488.91) = 3.57, p < .001 \) (Figure 3). We aimed to examine the role of controllability in influencing patterns of social comparison for each unique social issue.
Exploratory analyses: Controllability

Controllability and concern

A commonality across our analyses was clear issue-specific differences in participants’ perceptions and comparisons of their own and peers’ concern and action for social issues. For example, participants consistently estimated that they and peers would be most concerned and take the most action on racial injustice and COVID-19 over climate change, and estimated that they took more action than peers at all levels of concern for COVID-19, followed by climate change and racial injustice. We next examined whether these issue-specific differences interacted with belief in one’s personal control over contributions to each specific issue (e.g., controllability) through two multilevel models. The first had fixed effects of controllability (standardized), issue, and their interaction predicting personal concern (standardized), and a random effect of participant. The second had fixed effects of controllability (standardized), issue, and their interaction predicting personal action (standardized), and a random effect of participant.

We found a controllability × issue interaction in our multilevel model when examining personal concern as predicted by issue and controllability (interaction: issue × controllability $\eta^2_p = 0.05, 95\% CI [0.02, 0.09]$). As perceived issue controllability increased, personal concern for both climate change, $b = 0.37, se = 0.08, t(571.3) = 4.64, p < .001$, and racial injustice, $b = 0.39, se = 0.07, t(580.42) = 5.21, p < .001$, increased more strongly than COVID-19. Concern for racial injustice was not significantly different from concern for climate change across controllability, $b = 0.02, se = 0.07, t(515.13) = 0.3, p = .77$. Simple slopes analysis revealed that concern levels increased with greater perceived controllability for climate change, $b = 0.39, se = 0.06, t(635.37) = 6.57, p < .001$, and racial injustice, $b = 0.41, se = 0.05, t(632.67) = 8.07, p < .001$, but COVID-19 concern showed no change across controllability, $b = 0.02, se = 0.06, t(608.04) = 0.3, p = .77$ (Figure 4). We tested our interaction model (AIC = 1780.3, BIC = 1816.7) and found that, compared to a main effects model...
Greater perceived controllability was more strongly associated with increased personal action for racial injustice and climate change than for COVID-19. Note. Error ribbons denote standard error with issue and controllability (AIC = 1806.9, BIC = 1834.2), the interaction model had a better model fit, $\chi^2(2) = 30.62, p < .001$.

Controllability and action

We also found evidence for a controllability $\times$ issue interaction in our multilevel model when examining personal action as predicted by issue and controllability (interaction: controllability $\times$ issue $\eta^2_p = 0.06$, 95% CI [0.03, 0.1]). As perceived controllability increased, personal action for both climate change, $b = 0.38, se = 0.07, t(598.99) = 5.59, p < .001$, and racial injustice, $b = 0.32, se = 0.06, t(610.91) = 5, p < .001$, increased relative to COVID-19. Action for racial injustice was not significantly different from action for climate change across controllability, $b = 0.06, se = 0.06, t(531.74) = 0.99, p = .32$. Simple slopes analysis revealed that action levels increased with greater perceived controllability for climate change, $b = 0.51, se = 0.05, t(661.13) = 10.16, p < .001$, and racial injustice, $b = 0.45, se = 0.04, t(659.06) = 10.41, p < .001$, and COVID-19 (albeit less strongly), $b = 0.13, se = 0.05, t(639.52) = 2.53, p = .01$ (Figure 5). We tested our interaction model (AIC = 1529.9, BIC = 1566.3) and found that, compared to a main effects model with issue and controllability (AIC = 1561.4, BIC = 1588.7), the interaction model had a better model fit, $\chi^2(2) = 35.5, p < .001$.

DISCUSSION

In a university sample collected in Fall 2020, we examined social comparison of concern and action for three relevant social issues: climate change, racial injustice, and COVID-19. We found evidence for three general conclusions. First, individuals estimated that their concern levels regarding major social issues tended to exceed those of their peers. Next, individuals tended to estimate taking more actions than peers regarding COVID-19 and climate change, but not racial
injustice. Finally, estimations of greater personal than peer action increased with greater levels of concern across all three issues. Analyses examining issue-specific differences indicated that participants estimated greater concern and action both for themselves and their peers regarding COVID-19 and racial injustice relative to climate change. Exploratory analyses indicated that concern and action regarding racial injustice and climate change, but not COVID-19, were positively associated with increases in perceived controllability.

Consistent with our hypothesis, participants estimated that they were more concerned than peers regarding climate change, racial injustice, and COVID-19. This suggests that self-serving bias may influence how individuals evaluate their own and others’ concerns for large-scale social issues. Despite the unique features (e.g., visibility, shared outcomes) that these types of issues may have, these unfortunately do not serve to minimize self-serving bias. For example, people may discuss beliefs and actions about issues amongst themselves and/or on social media, but this does not necessarily increase accuracy when making social comparisons. Individuals tend to share information on social media when they encounter it more frequently (Hodas & Lerman, 2014), making social media a useful source of normative information on social issues within peer groups. However, social media may contribute to individuals’ self-serving biases if they compare their extensive (and often unposted online) knowledge of their own interactions with social issues to the limited displays of peers’ concern and action that social media can provide.

As hypothesized, we observed relative self-favoring inaccuracy in social comparison regarding climate change, racial injustice, and COVID-19 concern. People tend to view themselves as more ethical than others and more readily recall instances in which they behaved morally well than immorally (Helion et al., 2020). We similarly found that participants overestimated their own intentions and actions relative to peers for these morally relevant social issues. This finding is also consistent with classic research on the fundamental attribution error (Jones & Harris, 1967). That is, although one likely does about as much as peers on each social issue, failure to act or demonstrate concern is likely attributed to situational factors for the self but dispositional ones for peers.

Greater access to knowledge of personal action may have also led participants to overestimate their own relative to that of peers for climate change and COVID-19 but not for racial injustice. For example, COVID-19 actions are comparatively constrained and frequent and can require both active, visible demonstrations of precaution, such as mask wearing, and inactive ones, such as refraining from social activities. Regardless of whether individuals engage in these behaviors due to external factors (e.g., government-imposed requirements, fear of social repercussions; Van Bavel et al., 2020), participants may have found it easier to recall their own frequent COVID-19 actions and thus would remember having taken more action than peers, and may have also attributed this to greater personal concern. Participants could likely cite many personal climate change and COVID-19 actions taken that would be difficult to observe in peers (for example, individuals would know of times when they chose to bike rather than drive to work but would likely not have access to this information in others). Although, like climate change, racial justice actions do not have an externally mandated default (as compared to COVID-19), they were likely more visible during the time period of data collection (Dave et al., 2020) and more likely shared on social media (Liebermann, 2020); this may have reduced the information discrepancy between self and peers and driven accuracy in estimated peer action for racial injustice compared to both COVID-19 and climate change.

Individuals tend to show less self-serving bias in concrete (vs. abstract) domains and in those in wherein performance benchmarks are more objective (Alicke & Govorun, 2005; Dunning, Meyerowitz, & Holzberg, 1989; Sedikides & Strube, 1997). Participants evaluated their own and
peers’ concern and action on social issues retrospectively over a set time point (the preceding 2 weeks), making these items relatively concrete. Individuals were likely aware of the extent to which they had engaged in relevant activities at that time, leaving less room for self-serving bias than in a more abstractly framed domain (e.g., “helping others”) or ambiguous time period (e.g., “recently”). The finding that self-serving bias nevertheless clouded perceptions of personal and peer interaction with social issues is particularly fascinating given these considerations.

Across issues, participants who were more greatly concerned indicated taking more action than they estimated peers had. This positive relationship aligns well with the Theory of Planned Behavior (Ajzen, 1991), which posits that individuals’ attitudes, in-group norms, and perceived self-efficacy (or self-control) influence one another, resulting in increased intention formation and finally, action (Ajzen, 1991; Armitage & Conner, 2001). However, this tendency to form one’s own action intentions in part through perceptions of peers—which may be underestimated—may indeed widen the attitude-behavior gap (Albarracín & Shavitt, 2018). Thus, even concerned individuals may feel that they are taking sufficient action through an inaccurate comparison to peers. Likewise, the belief that one’s actions are effective at controlling contributions to a social issue (e.g., perceived self-efficacy) may be associated with greater action (Hornsey et al., 2015).

Exploratory analyses point to controllability as a potential mechanism for issue-specific differences in our findings. Participants’ estimates of personal concern and action for racial injustice and climate change both increased with greater perceived controllability but remained relatively consistent for COVID-19 across all levels of perceived controllability. This makes sense given the types of actions taken to mitigate COVID-19 relative to the other issues. Actions to mitigate COVID-19 are circumscribed, limited, and benefit from public health messaging, whereas climate change and racial injustice do not benefit from similarly prescribed mitigation actions. Additionally, individuals themselves are potential vectors for the spread of COVID-19, whereas the other two issues are more systemic in terms of both their causes and solutions (Castle et al., 2019; Shepardson et al., 2012). Thus, belief in action self-efficacy might be higher for COVID-19 than for climate change and racial injustice. Expected issue duration may also set COVID-19 apart; at the time of data collection, COVID-19 stood alone relative to climate change and racial injustice in its relatively short existence, its novelty, its cause (a virus as opposed to the consequences of historical patterns of human behavior), and potentially, its expected duration as opposed to racial injustice and climate change.

Differences in perception of each issue may also have to do with the relative salience of each issue at the time of data collection (Perrin, 2020). This consideration is exemplified in our findings that, for both concern and action analyses, participants expected that they and peers both prioritized COVID-19 and racial injustice over climate change. Indeed, polls of U.S. priorities collected in August 2020, around the time of our study, indicated that among Americans, 62% found COVID-19, 52% found racial and ethnic equality, and 42% found climate change to be “very important” issues leading up to the 2020 election (Pew Research Center, 2020). Taken together, the varying cognitive, personal, social, and affective experiences associated with each issue might impact mechanisms of social comparison.

**Limitations**

A limitation in the analysis is attrition and variability of participants in reporting each measure recorded, resulting in slightly differently-powered analyses. As all analyses were conducted within-participants and with a still-robust sample size, we hope to somewhat alleviate these
concerns. It is possible that participants may have been more conscientious than the overall sample and thus more likely to participate in a later wave of a longitudinal study (Sitzmann & Johnson, 2012). Conscientiousness has been linked to greater climate change concern (Hirsh, 2010), so if true, participants may care more about issues of interest, although participants’ personal concern levels do not seem to be extraordinarily high for any issue (i.e., all means were fairly close to 3 out of 6). Last, the generalizability of study findings is constrained to the demographic groups of participants, especially as each issue can differentially impact demographic groups (Bullard, 1999; Price-Haywood et al., 2020; Quan et al., 2021; Roberts & Rizzo, 2021). For example, the social issues examined may be experienced differently by young adults (the majority of our sample) than by other age cohorts (Corner et al., 2015; Bruine de Bruin, 2021; Bernard, Smith, & Lanier, 2021) and by Democratic individuals (the majority of our sample) than by Republican individuals (Schuldt, Eiseman, & Hoffmann, 2020; Dunlap & McCright, 2008; Grossman et al., 2020; Drakulich et al., 2020).

Implications

Taken together, individuals are relatively self-favoring when considering peer concern on social issues relative to their own, and concern for each issue is associated with increased belief that personal action outweighs that estimated of peers. This indicates that people may overestimate both concern and action for social issues relative to peers, and even those who are highly concerned may be satisfied with reduced action to mitigate social issues as a result. Concern and action taken on social issues might be influenced by personal attitudes, social norms, norm visibility, individual differences, and issue-specific risk perception factors. For community leadership and members alike, prioritizing concern for social issues may increase action, mitigating the negative impact these issues present to local and global societies. Perceived controllability may also underlie the association between concern and action for long-standing, complex issues (e.g., racial injustice and climate change) but perhaps not for more novel issues with relatively circumscribed actions (e.g., COVID-19). Future research should further explore factors supportive of shared societal goal pursuit.

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