

1

Multiple social identities cloud norm perception: Responses to COVID-19 among university aged Republicans and Democrats

Erin Krupka 1,* , Hanna Hoover 2 , Catherine Eckel 3 , Tanya Rosenblat 1 , Oluwagbemiga Ojumu 4 , and Rick K. Wilson 5

 ¹University of Michigan, School of Information, Ann Arbor, Michigan, USA
 ²Northeastern University, School of Public Policy and Urban Affairs, Boston, Massachusetts, USA
 ³Texas A&M University, Department of Economics, College Station, Texas, USA
 ⁴Prairie View Texas A&M University, Department of Management and Marketing, Prairie View, Texas, USA
 ⁵ Rice University, Department of Political Science, Houston, Texas, USA

Correspondence*: Erin Krupka School of Information, University of Michigan 105 S State St, Ann Arbor, MI 48109, USA ekrupka@umich.edu

2 ABSTRACT

Most work on social identity, defined as one's sense of self derived from membership to social 3 4 groups, focuses on a single identity and its behavioral consequences. But a central insight of social identity theory is that people belong to multiple social groups, derive self-esteem from 5 multiple identities and care to conform to the norms for those identities. However, very little work 6 has turned its attention to understanding when and how multiple social identities interact. We 7 motivate hypotheses with a framework that extends a social identity model to include multiple 8 identities. Using a longitudinal sample (N > 600) of university students located throughout the US, we use university social identity, and the associated university norms, to characterize COVID 9 10 related social distancing norms between April and October of 2020 and then unpack how another 11 identity, the student's political identity, impacts perception of those norms. Despite incentives to 12 do otherwise, we find that beliefs about university norms differ depending on the respondent's 13 political identity. We relate our results back to a model of social identity. 14

15 Keywords: COVID-19, norms, preferences, social identity, norm miscoordination

1 INTRODUCTION

Humans face significant threats to health and well-being that stem from complex, global, and rapidly evolving events triggered by climate change and other human activity (McMichael et al., 2006; Carlson et al., 2022). Many of these health threats unfold quickly, demand initial human behavior change prior to government policy (which often lags), and many times become highly politicized (Fuentes et al., 2020). During the wake of the COVID-19 pandemic, norms surrounding precautionary behavior, i.e. hand washing, mask wearing, and so on, quickly emerged and subsequently became highly politicized. In this study, these features of the pandemic allow us to focus on understanding when and how multiple social identities can interact and spillover so as to impact behavior and beliefs around adoption of precautionary behavior.

Social identity is defined as one's sense of self derived from membership to social groups (Tajfel et al., 24 1979; Akerlof and Kranton, 2005). Central insights of Social Identity Theory are that people belong to 25 26 multiple social groups, derive self-esteem from their social groups and that they care to conform to the norms for their social groups. Since the introduction of social identity into economics, work has focused 27 28 on establishing the importance of social identity in being able to explain conflict between groups, human capital investment decisions, in and outgroup bias, and differences in time and risk preferences (Akerlof 29 and Kranton, 2000, 2002; Chen and Li, 2009; Benjamin et al., 2010; Whitt et al., 2021; Charness and Chen, 30 2020). However, very little work has turned its attention to the consequences of having multiple social 31 identities that may intersect in ways that impact how we understand and experience the world. 32

In the present study we test for the impact of a student's political identity on their beliefs about COVID related norms for their university identity. We motivate our predictions with a framework provided by social identity theory (Akerlof and Kranton, 2000) and use panel data collected between April and October 2020 at three universities in Texas to test these predictions.

We begin with the "behavioral" premise that precautionary behavior is both a personal decision and a 37 social interaction. Within the social identity framework, people hold multiple identities simultaneously 38 and, therefore, are aware of multiple group-norms (Akerlof and Kranton, 2005). Injunctive norms ascribe 39 appropriateness to sets of actions one could take in a particular situation and are defined for each specific 40 identity (or group) and apply to all members of the social group for that situation. The beliefs that 41 support injunctive norms are second-order beliefs (beliefs about what others believe is appropriate or 42 inappropriate).¹ Descriptive norms ascribe expectations of frequency to sets of actions and beliefs are 43 group specific. The beliefs that support descriptive norms are second-order beliefs (beliefs about what 44 others believe is most commonly done). 45

46 The theory of social identity also assumes that some identities (and their norms) are more influential to the decision maker than others (Tajfel et al., 1979). Prior work suggests that political identity is likely 47 to be among the more strongly influential identities relative to other identities.² However, recent studies 48 demonstrate that context, and incentives can make one identity more salient over another in a decision 49 maker's mind (Shih et al., 2006; Akerlof and Kranton, 2005; Benjamin et al., 2010; Burks and Krupka, 50 2012; Chang et al., 2019). In our study we will use both incentives (in the form of cash payments to make 51 accurate guesses) and context (in the form of evolving state mandated COVID restrictions) to increase the 52 salience of *non-political* identity norms in a context where political identity may matter. 53

The setting for our study, the emergence of COVID-19, is particularly well suited to this analysis for two 54 reasons. In late December of 2019 COVID-19 emerged as a significant health threat.³ As Haushofer and 55 Metcalf (2020) note, for most of 2020 the only approaches to reducing transmission were behavioral (hand 56 washing, social distancing, masks, etc.). Thus, in the early months, COVID-19 could only be combated 57 with changes in social norms and collective action on a large scale (Van Bavel et al., 2020).⁴ However. 58 responses to the virus also became highly politicized (Allcott et al., 2020; Kushner Gadarian et al., 2020; 59 Gollwitzer et al., 2020; Druckman et al., 2021; Kahane, 2021). With our data collection strategy, we use 60 61 incentives to make the university identity norms for social distancing salient. We leverage the politicization of pandemic mediation efforts during our window of observation, as well as state-mandated COVID-19 62 restrictions, to test for the impact of an identity we do not make salient in the study, political identity, on 63 perception of norms for our salient identity. 64

¹ These are different from first-order beliefs of appropriateness, which instead are beliefs about what the individual personally considers appropriate or inappropriate. This distinction is important and discussed in Nosenzo and Görges (2020).

² Though studies vary in terms of sampling strategy (population or specialized samples) and methodology (individual-level surveys, mobility data by locality, as well as county or state level compliance or mortality data), political affiliation remains an important correlate of behavior and policy preferences in the US. Democrats are more likely to comply with COVID restrictions and more likely to support policies designed to limit the spread of the virus or mitigate its impact (Allcott et al., 2020; Kushner Gadarian et al., 2020; Gollwitzer et al., 2020; Druckman et al., 2021; Kahane, 2021; Pickup et al., 2020; Milosh et al., 2020). Responses to Governors' recommendations are similarly partisan (Grossman et al., 2020). The disparities are magnified as the two groups express greater dislike for one another (Druckman et al., 2021), and trusted news sources and political messaging may have exacerbated differences (Zhao et al., 2020; Pennycook et al., 2021).

³ In the space of little over a year, the virus infected and killed over half a million people in the US. In addition, COVID-19 contributed to the most rapid change in the unemployment rate in modern American history (Chetty et al., 2020).

⁴ Social change is often supported by social norms that are grounded in community values and articulated around collective objectives (Ostrom, 2000; Hardin, 2015; Sherif, 1988).

Our contributions are to characterize the important role that multiple identities can play in shaping beliefs. We show that social identities may impact each other, such that one identity obscures an actor's ability to accurately perceive the norms of another identity even when there are salient incentives for accurate judgment. We also contribute to an important literature which focuses on psychological mechanisms that can result in spillovers. We highlight how social identity theory can account for this mechanism.

2 MATERIALS AND METHODS

70 2.1 Theory

To motivate our empirical approach, we adopt a framework inspired by Benjamin et al. (2010). In this framework decision makers wish to comply with the norm for their social identity and increasing salience of the identity reveals the marginal effect of increasing the strength of affiliation with that category (Benjamin et al., 2010).⁵ We extend this framework to a scenario where there are multiple identity considerations.⁶

Let x be some action choice, in our case, the level of COVID-19 precautionary behavior. Individuals belong to two social categories, university ($U = \{Rice, TAMU, PVAMU\}$) and political identity ($P = \{Republican, Democrat, Independent\}$) with strength $s_U \ge 0$ and $s_P \ge 0$. Denote action x_0 as the subject's preferred action in the absence of any identity considerations. Let x_U denote the action prescribed for members of the social category U and let x_P denote the action prescribed for members of social category P. The individual chooses to maximize the following equation:

$$U = -w_0(x - x_0)^2 - w_U(s_C)(x - x_U)^2 - w_P(s_P)(x - x_P)^2$$
(1)

81 where $0 \le w_U(s_U)$ is the weight placed on the university social category U and $0 \le w_P(s_P)$ is the 82 weight placed on political identity social category.⁷ We assume that $w_K(0) = 0$, $w'_K > 0$ for K = U, P. 83 In other words, the disutility of deviating from one's category is an increasing function of the strength of 84 that category. We assume that s_U and s_P have steady-state values \bar{s}_U and \bar{s}_P . It is possible that s_U and s_P 85 can be perturbed away from \bar{s}_U and \bar{s}_P by a social category prime or through increased identity salience 86 ε_U and ε_P .⁸ For example the strength of the identity affiliations might follow an AR(1) process such as: 87 $s_{U,t} = (1 - \phi)s_{U,t-1} + \phi \bar{s}_U + \varepsilon_U$ and $s_{P,t} = (1 - \lambda)s_{P,t-1} + \lambda \bar{s}_P + \varepsilon_P$. The first-order condition provides 88 the following optimal action:

$$x^*(s_U, s_P) = w_0 x_0 + w_U(s_U) x_U + w_P(s_P) x_P$$
(2)

Intuitively, the agent's optimal action depends on their ideal action, the university-level social norm and the political-affiliation social norm, for example. Over the three waves of data collection, we may see the agents take different levels of precautionary behavior. More specifically, for those with different political affiliations, we expect that behavioral differences will be driven by $w_P(s_p)$, conditional on x_0 being equal across political affiliations. In our theoretical model, perception of an unrelated identity-specific social norm is independent from another social identity. This leads us to our main hypothesis of interest:

Hypothesis 1. Elicited university-identity social norm x_U is independent of political identity considerations (*P*).

 $[\]frac{5}{10}$ The idea that actors wish to comply with identity-dependent social norms has been advanced in multiple papers elsewhere (d'Adda et al., 2020; Akerlof and Kranton, 2005). For example, Akerlof and Kranton (2005) note that "... much of utility depends not only on what economists normally think of as *tastes*, but also on *norms* as to how people think that they and others *should* behave"

⁶ We take a reduced-form approach to model norm compliance. We start with the assumption that individuals care about behaving in a manner consistent with norms rather than developing a theory of norm compliance based on underlying preferences and refer to Bénabou and Tirole (2011) and Andreoni and Bernheim (2009) for micro-foundations.

⁷ For ease of interpretation, one may include a normalizing constant of $\left|\frac{1}{w_0 + w_U(s_C) + w_P(s_P)}\right|$ in the utility function. This common factor, which is 1 over

the sum of the three weights, ensures that the weights determine the relative rather than the absolute importance of each norm. Because utility functions are invariant to linear transformations the inclusion of this constant does not change the optimal solution in (2). We include this footnote as it may be more intuitive for some readers.

⁸ We use the assumption of steady-state identity saliently and the process of being temporarily perturbed as described in Benjamin et al. (2010).

97 We provide direct incentives to coordinate on the university social norm. Thus, if political identity 98 influences responses in the coordination game or if it influences responses in the face of state-wide imposed 99 COVID restrictions, then this feature is not included in our model.⁹

100 2.2 Three waves of data collection

The project builds on samples of students from Rice University, Prairie View A&M University (PVAMU) and Texas A&M University (TAMU) that were recruited to participate in two prior studies which began in 2016.¹⁰ The same battery of questions were asked over three waves, which were administered two months apart in time. The first wave began in early April 2020, the second wave began in late July, and the last wave began mid-October 2020.¹¹. Altogether 633 respondents participated in all three waves of the study. In our preferred specification, we rely on the sub-sample of subjects who completed all three waves of the survey to avoid issues of attrition.¹²

108 2.3 Eliciting and constructing the norms indices in each wave

109 The norm elicitation modules elicit beliefs about the injunctive and descriptive norms and, when aggregated, provide an empirical proxy for the respective university norms. The procedure follows the 110 method developed in Krupka and Weber (2013); just as in their paper, respondents were incentivised to 111 coordinate their answers with other participants from the respondent's same university. We describe a 112 specific action (social distancing, of avoiding religious services, and of avoiding hanging out with friends), 113 114 and ask subjects to coordinate on rating the appropriateness (in the case of the injunctive norm) and prevalence of the action (in the case of the descriptive norm) with another subject who is a randomly 115 chosen participant from their university. See the Supplementary Materials for the exact phrasing of the 116 norm elicitation questions. 117

118 Respondents play a coordination game over four possible appropriateness ratings: "very socially 119 appropriate," "socially appropriate," "socially inappropriate," and "very socially inappropriate." This 120 description, along with the four-category scale, follows that of Krupka and Weber (2013). In the case of 121 eliciting beliefs about the descriptive norm, respondents play a coordination game over four possible levels 122 of activity: "Most are not doing this (<20%)", "some are not doing this (<50%)", "some are doing this 123 (>50%)", and "most are doing this (>80%)".¹³ Subjects have an incentive to anticipate and match how 124 other participants from their university will rate an action.¹⁴

We construct an individual index for beliefs about the injunctive and descriptive norm. We build this index in each wave by taking the average of the subject's beliefs about the university norms. A respondent's belief (inj.) norm index ranges from 0 (very inappropriate) to 100 (very appropriate). The belief (desc.) norm index ranges from 1 (most are not doing this) to 100 (most are doing this).

⁹ Though there are multiple reasons why individuals might report inaccurate beliefs of the university-level social norm - they may hold inaccurate beliefs due to motivated beliefs (Thaler, 2021; Mobius et al., 2011) or they have a biased representation of the university social norm due to the belief formation process (Ross et al., 1977; Prentice and Miller, 1993; Pronin et al., 2004) - finding that norm perception is influenced by an other identity (here political identity) would be an important contribution for how we model social identity.

¹⁰ Rice University is a private research university in Houston, Texas; Texas A&M is a large public land-grant research university in College Station, Texas and the flagship institution of the Texas A&M University system; and PVAMU is a historically black university also in the Texas A&M University System. See the Supplementary Materials for additional information on these prior studies.

¹¹ During that time, universities closed and students moved. We discuss this and further study details in the Supplementary Materials and in Figure S1

¹² Table S1 in the Supplementary Materials reports the differences in mean demographic variables of those who complete all three waves and those who did not complete all three waves.

¹³ Krupka and Weber (2013) provide evidence that collectively-recognized social norms create focal points in these matching game (see also Goerg and Walkowitz (2010); Schelling (1980); Mehta et al. (1994); Sugden (1995)).

¹⁴ Details of the experimental design can be found in the Supplementary Materials.

3 **RESULTS**

129 3.1 The participants

We limit our analysis to 633 subjects who completed all three waves of the survey. We summarize the
time invariant controls in Table S2 by reporting the means (along with standard errors in parentheses) and
the number of observations per university in our sample.

The majority of our subjects (79%) attend Rice University, with the remaining 12% and 9% attending Texas A&M and Prairie View A&M University, respectively. Our sample consists of 18% black respondents and less than half male respondents (38%).¹⁵ About 80% of all students in our sample identify themselves as Democrats, 16% as Republicans and 4% as Independents. A large majority of students from Prairie View A&M (88%) and Rice University (81%) report that they identify with the Democratic Party. In comparison, there is more heterogeneity among the students from Texas A&M University where about 70% report identifying with the Democratic Party and 26% with the Republican Party.¹⁶

In all regressions we control for COVID-19 infection data from the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (Dong et al., 2020). Seven-day moving averages of daily new cases and deaths are computed at the county-level and are merged with respondents by both location and date completed in each of the waves of the study.

144 3.2 Elicited university norms are clouded by political identity

Figure 1 plots the average norm index by political affiliation across each survey wave.¹⁷ Overall, we find a downward trend in the norm indices; subjects beliefs about the university injunctive norm (what one ought to do) are softening such that actions in wave 3 are viewed as less strongly prescriptive than in wave 1. We also see that the university descriptive norm (what others are doing) to prevent the spread of COVID-19 is becoming weaker such that respondents believe fewer people are taking precautionary measures in wave 3 than wave 1.

151 When looking at the norm index level by political affiliation, the injunctive norm index is not significantly 152 different between Democrats and Independents. For Republicans, however, they report a university 153 injunctive norm index that is significantly lower than the university injunctive norms index reported by 154 Democrats in wave 1 and wave 3, although not significantly lower for wave 2 (p < 0.01 for wave 1, p > 0.1155 for wave 2, and p < 0.1 for wave 3; see Supplementary Materials Table S4). In other words, Republican 156 student respondents believed the university injunctive norm for COVID-19 precautionary behavior was 157 lower than what Independent and Democrat students believed.

For the descriptive norm index, we see a strong ordering of beliefs: Students who identify as Democrats 158 believe more people are engaging in precautionary behavior than students who identify as Independents, 159 and than students who identify as Republicans. This difference in ranking is statistically significant for 160 wave 1 and wave 2 between Democrats and Republicans but not for other waves (p < 0.05 for wave 1, 161 p < 0.05 for wave 2, and p > 0.1 for wave 3; see Table S5 in the Supplementary Materials). When we look 162 at the norm index separately for each University, (Figure S2, Figure S3, Figure S4 in the Supplementary 163 164 Materials) we see similar trends. Across survey waves, injunctive norms were higher than descriptive 165 norms.

166 **Result 1.** Student respondents who are Republicans or Democrats hold different beliefs about the university 167 injunctive norms in wave 1 (p < 0.01) and wave 3 (p < 0.10). Student respondents who are Republicans 168 and Democrats hold different beliefs about university descriptive norms in wave 1 (p < 0.05) and wave 2 169 (p < 0.05).

¹⁵ For Prairie View A&M University, only 8% of the respondents were men. When we loosen the inclusion restriction of our sample and allow for individuals which do not have all three wave observations, we see that 19% of the Prairie View A&M University respondents are male, in comparison to 46% for Rice University and 39% for Texas A&M University. This gender difference for Prairie View, however, may be attributable to the fact that 60.9% of the incoming freshmen in 2016 were females.

¹⁶ Table S1 in the Supplementary Materials shows that the in-sample and out-sample group statistically differ across university and race, but not among political-identity.

¹⁷ The numbers used in the figure can be found in the Supplementary Materials in Table S3 which reports the injunctive norm and descriptive norm index by political identity across all three waves.

170 One possibility for why political identity is correlated with university norm perception is that perhaps 171 the incentives to use university norms as focal points in our coordination games were not salient *enough* to motivate subjects to disregard the political identity norms while playing the coordination game. We 172 can test this critique by using the emerging COVID restrictions over our observation window. COVID 173 restrictions should make coordination in the norms task easier, and lead to less miscoordination, since 174 175 the restrictions should cause *more* people to take *similar* social distancing actions. Subjects who want to 176 maximize earnings in the coordination game should be able to use those restrictions to inform their guesses and especially so when forming guesses around the descriptive norm; as a result, we should see lower 177 miscoordination in the presence of restrictions. 178

To test the impact of restrictions on perceptions of the norms we merge restrictions data onto our data set. The restrictions data comes from the Oxford COVID-19 Government Response Tracker (OxCGRT) maintained by the University of Oxford's Blavatnik School of Government (Hale et al. (2020)). Governmental restrictions are recorded at the state-level and reported daily. We utilize their reported stringency index which is composed of nine policy measures.¹⁸ Using these measures, and re-weighting based on if the restriction policy is targeted or general, the stringency index is re-scaled such that the minimum and maximum values are between 0 and 100.¹⁹

In Figure 2 we plot the stringency index (black line) along with the precautionary behavior index (gray), beliefs (desc.) norm index (light green), and the beliefs (inj.) norm index (red line) over time for wave 1. Visually, we see that the stringency index is declining over our observation window as is the descriptive and injunctive norm. Note that this figure shows movement within a wave, as data collection was in process, as well as between waves. Smooth lines connect the three waves of data collection.

Our preferred method of measuring miscoordination is the difference between individual-level second order beliefs about the norm and the weighted modal response of the respondent's respective university within each wave.²⁰ From the inferred level of miscoordination in each of these three questions, we compute the average level of miscoordination for descriptive norms and injunctive norms. For example, if a survey taker's responses perfectly coincided with the university-level modal response, their level of miscoordination would equal 0. The summary statistics of this constructed descriptive and injunctive norm miscoordination by political affiliation is located in Table S8 in the Supplementary Materials.

198 Result 2. We fail to find that COVID restrictions reduce miscoordination among respondents.
199 For Republican student respondents, COVID restrictions lead to an increase in descriptive norm
200 miscoordination, such that a 1 unit increase in the stringency index increases miscoordination by 0.01
201 percentage points for the descriptive norm.

We use a random effects OLS model to test for correlations between changes in miscoordination and the stringency index. The results of this regression are found in Table 1. Columns (2) and (4) contain stringency index and party affiliation interaction terms which allows for heterogeneous effects of the stringency index on miscoordination.

By looking at the estimated coefficients on the party indicator variables, we see that Republicans and Democrats have the same level of miscoordination on the injunctive norm ($\beta = 0.03$, p > 0.1, (1); $\beta = 0.07$, p > 0.1, (1)). When we include party affiliation and stringency index interaction terms, we find no evidence that this model specification fits closer to true data generating process (Vuong Statistic = -1.03, p > 0.1, (2)). Furthermore, we find no differences in injunctive norm miscoordination by party affiliation in response to the stringency index ($\beta = 0.00$, p > 0.1, (2)).

¹⁸ These include school closing, workplace closing, cancelling of public events, restrictions on gathering size, closure of public transport, restrictions on internal movement, restrictions on international travel, and public information campaigns.

¹⁹ Several papers have used other sources for policy restrictions, such as data provided by the National Association of Counties (NACo) - County Explorer (Brodeur et al. (2021); Amuedo-Dorantes et al. (2021)). We opt to use the Oxford COVID-19 Response Tracker as policies are reported throughout our entire time period of interest whereas the NACo data was last updated on April 15 2020.

 $^{^{20}}$ For Texas A&M, the observed modal response does not correspond to the university-level modal response, as the survey intentionally over-sampled Black students from a previous study. To correct for this over-sampling, we calculate survey weights by iterative proportional fitting (raking) and use the race distribution of each university in Fall of 2020. The sum of the weights, as opposed to the sum of the observations, is used to determine the modal response of each norm elicitation task. Our results are robust to the specification were we use the observed modal response to calculate miscoordination instead of the weighted modal response.

212 When we look at the descriptive norm, however, we see different levels of descriptive norm 213 miscoordination. Republicans report lower levels of descriptive norm miscoordination ($\beta = -0.68$, p < 0.01, 214 column (4)). Moreover, we find that Republicans respond to changes in the stringency index by increasing 215 their level of descriptive norm miscoordination, such that a one unit increase in the stringency index 216 increases miscoordination by 0.01 percentage points (p < 0.01, column (4)). Neither Independents nor 217 Democrats respond in such a way (0.00, p > 0.1, column (4); 0.00, p > 0.1, column (4)).²¹

218 This positive coefficient on the interaction term for Republicans and the stringency index is surprising at first glance but can be explained. Intuitively, COVID-19 restrictions should result in more people doing 219 the same thing and thus, make coordinating on prevalence of social distancing easier rather than harder. 220 However, Republicans are the most pessimistic about the prevalence of others engaging in precautionary 221 222 behavior at their university (relative to Democrats and Independents) and their beliefs remain relatively 223 stable across waves (we see this in the means of the descriptive norms index reported in Table S3 in the Supplementary Materials). This implies that most of the change in miscoordination is being driven by 224 changes in the norm rather than Republicans altering their beliefs.²². We also run specifications utilizing the 225 unweighted norm miscoordination measures to demonstrate the robustness of our results. These regression 226 results are contained Table S14 in the Supplementary Materials.²³ 227

In sum, we find that descriptive and injunctive norm miscoordination increases between waves 1 and 228 229 3 for Democrats and Independents while Republicans are mostly stable. Restrictions are loosening (per the visual evidence presented in Figure 2) and as such one might expect increased miscoordination by 230 wave 3. However, we find that Republican beliefs regarding the descriptive norm remain largely unchanged 231 during our observation window. Said differently, this analysis suggests that even with incentives (in the 232 233 coordination game) to coordinate on university norms and with local restrictions that make behavior more uniform (affecting precisely the descriptive norm), Republicans are unable to correct for the impact of their 234 235 political identity.

4 DISCUSSION

Our contributions are to characterize the important role that multiple identities can play in shaping beliefs. 236 237 We show that social identities may impact each other, such that one identity obscures an actor's ability to accurately perceive the norms of another identity even when there are salient incentives for accurate 238 judgment. In our study, the target population is that of college students. We leverage the unique situation 239 240 created by the presence of COVID (for which there was no vaccine at the time). COVID demanded rapid changes in norms and became highly politicized during our observation window. As such, it provides 241 an empirical test of how multiple social identities can interact and spillover with resulting differences in 242 behavior. 243

Overall the theoretical framework provided by social identity theory allows for both heterogeneous relationships between norms and behavior (different weights, for example, on injunctive and descriptive norm conformity by reference group) and could allow for multiple identities. However, the latter aspect of the model is rarely explored. We provide evidence that joins a chorus of other findings which substantiate the claim that identity matters for behavior and that conformity to norms for identity adds additional explanatory power to organize observational data (see for example Akerlof and Kranton (2005); Chang et al. (2019); Benjamin et al. (2010); Chen and Li (2009).

We extend this literature by providing a first empirical insight into how multiple identities interact. Akerlof and Kranton (2002) develop a theoretical model in which people have multiple identities ("looks", "jocks", and "burnouts" in a fictional high school setting), and focus on when someone, who could belong to multiple identities, chooses one over the other. Choice is modeled as a function of characteristic match and differential returns to identities. We show that there may be identities (which we are more attached

²¹ We also find that controlling for the heterogeneous response to the stringency index by political affiliation is influential to the model fit, given the Vuong statistic of -2.37 (p < 0.05, column (4)).

²² This can also be seen in Table S8 in the Supplementary Materials. As a robustness check, we run an alternative regression with an multiordinal logit with mixed effects. The results are quantitatively similar and can be found in Supplementary Materials Table S13

²³ In the Supplementary Materials we also show that this 'clouding' of perception of university norms does not happen when the context is a-political. A description of the robustness check and the results of these tests are presented in Table S11.

to or are more salient in our minds) that affect our ability to perceive the norms associated with other 256 257 identities. One implication for theory is that there may be super-identities (eg. race, gender, politics) that spillover and can be used to sufficiently predict behavior. Thus, appellations to one's identity as "a good 258 citizen" may fall on deaf ears when political identity is a super-identity. 259

ACKNOWLEDGMENTS

260 Thanks to Nishita Sinha, who contributed to the design of the study. Thanks to Mahmoud El-Gamal and research assistants Andy Cao, Liam Coolican, Allegra Hernandez, Carly Mayes, Sandhya Srinivas, Nanyin 261 Yang, Sora Youn. Lab managers: Economic Research Lab, TAMU, David Cabrera; Behavioral Research 262 Lab, Rice, Annie Pham. 263

CONTRIBUTION TO THE FIELD

Most work on social identity focuses on a single identity and its behavioral consequences. But a central 264 insight of social identity theory is that people belong to multiple social groups and care to conform 265 to the norms of multiple identities. During the wake of the COVID-19 pandemic, norms surrounding 266 precautionary behavior emerged and subsequently became politicized. In this study, we find evidence that 267 268 political identity affects one's ability to perceive the norms associated with a different social identity; there 269 is spillover from one identity to another even when there are salient incentives for accurate judgment. Our contributions are to characterize the important role that multiple identities can play in shaping beliefs. We 270 also contribute to an important literature which focuses on psychological mechanisms that can result in 271 spillovers. We highlight how social identity theory can account for this mechanism. 272

CONFLICT OF INTEREST STATEMENT

The authors declare that the research was conducted in the absence of any commercial or financial 273 274 relationships that could be construed as a potential conflict of interest.

AUTHOR CONTRIBUTIONS

275 EK directed the research question and wrote the paper. HH conducted the data analysis and aided in writing

the paper. CE, OO, RW designed and administered the study, and provided feedback in the writing process. 276

RW coded, cleaned, and prepared the data for use and archiving. TR aided in creating the theoretical model. 277

FUNDING

278 This study is funded by the National Science Foundation (For Rice University, SES-1534403 and SES-

2027556; for Texas A&M: SES- 2027548, SES-1534411, and SES-1530796; for the University of 279 Michigan: SES-2027513). This study has received IRB approval. Texas A&M University and Texas A&M 280 Prairie View University IRB Number: IRB2020-0379D. Rice University IRB Numbers: IRB-FY2020-278, 281 282

IRB-FY2021-114.

SUPPLEMENTAL DATA

283 Supplementary Material should be uploaded separately on submission, if there are Supplementary Figures, please include the caption in the same file as the figure. LaTeX Supplementary Material templates can be 284

found in the Frontiers LaTeX folder. 285

DATA AVAILABILITY STATEMENT

The datasets generated for this study can be found in the University of Michigan - Deep Blue Data 286 https://doi.org/10.7302/ghvd-xw58. 287

REFERENCES

- Akerlof, G. A. and Kranton, R. E. (2000). Economics and identity. *The quarterly journal of economics* 115, 715–753
- Akerlof, G. A. and Kranton, R. E. (2002). Identity and schooling: Some lessons for the economics of
 education. *Journal of economic literature* 40, 1167–1201
- Akerlof, G. A. and Kranton, R. E. (2005). Identity and the economics of organizations. *Journal of Economic perspectives* 19, 9–32
- Allcott, H., Boxell, L., Conway, J., Gentzkow, M., Thaler, M., and Yang, D. (2020). Polarization and
 public health: Partisan differences in social distancing during the coronavirus pandemic. *Journal of Public Economics* 191, 104254
- Amuedo-Dorantes, C., Kaushal, N., and Muchow, A. N. (2021). Timing of social distancing policies and covid-19 mortality: county-level evidence from the us. *Journal of Population Economics*, 1–28
- Andreoni, J. and Bernheim, B. D. (2009). Social image and the 50–50 norm: A theoretical and experimental
 analysis of audience effects. *Econometrica* 77, 1607–1636
- Bénabou, R. and Tirole, J. (2011). Identity, morals, and taboos: Beliefs as assets. *The Quarterly Journal of Economics* 126, 805–855
- Benjamin, D. J., Choi, J. J., and Strickland, A. J. (2010). Social identity and preferences. *American Economic Review* 100, 1913–28
- Brodeur, A., Grigoryeva, I., and Kattan, L. (2021). Stay-at-home orders, social distancing, and trust.
 Journal of Population Economics, 1–34
- Burks, S. V. and Krupka, E. (2012). A multimethod approach to identifying norms and normative
 expectations within a corporate hierarchy: Evidence from the financial services industry. *Management Science* 58, 203–217
- Carlson, C. J., Albery, G. F., Merow, C., Trisos, C. H., Zipfel, C. M., Eskew, E. A., et al. (2022). Climate
 change increases cross-species viral transmission risk. *Nature* 607, 555–562
- Chang, D., Chen, R., and Krupka, E. (2019). Rhetoric matters: A social norms explanation for the anomaly
 of framing. *Games and Economic Behavior* 116, 158–178
- Charness, G. and Chen, Y. (2020). Social identity, group behavior, and teams. *Annual Review of Economics* 12, 691–713
- Chen, Y. and Li, S. X. (2009). Group identity and social preferences. *American Economic Review* 99, 431–57
- Chetty, R., Friedman, J. N., Hendren, N., Stepner, M., et al. (2020). *How did covid-19 and stabilization policies affect spending and employment? a new real-time economic tracker based on private sector*data. Tech. rep., National Bureau of Economic Research
- d'Adda, G., Dufwenberg, M., Passarelli, F., and Tabellini, G. (2020). Social norms with private values:
 Theory and experiments. *Games and Economic Behavior* 124, 288–304
- Dong, E., Du, H., and Gardner, L. (2020). An interactive web-based dashboard to track covid-19 in real
 time. *The Lancet infectious diseases* 20, 533–534
- Druckman, J. N., Klar, S., Krupnikov, Y., Levendusky, M., and Ryan, J. B. (2021). Affective polarization,
 local contexts and public opinion in america. *Nature Human Behaviour* 5, 28–38
- Falk, A., Becker, A., Dohmen, T., Huffman, D. B., and Sunde, U. (2016). *The Preference Survey Module: A Validated Instrument for Measuring Risk, Time, and Social Preferences*. Tech. rep., IZA Discussion
 Papers. No. 9674
- Fuentes, R., Galeotti, M., Lanza, A., and Manzano, B. (2020). Covid-19 and climate change: a tale of two
 global problems. *Sustainability* 12, 8560
- Goerg, S. J. and Walkowitz, G. (2010). On the prevalence of framing effects across subject-pools in a
 two-person cooperation game. *Journal of Economic Psychology* 31, 849–859
- Gollwitzer, A., Martel, C., Brady, W. J., Pärnamets, P., Freedman, I. G., Knowles, E. D., et al. (2020).
 Partisan differences in physical distancing are linked to health outcomes during the covid-19 pandemic.
 Nature human behaviour 4, 1186–1197
- Grossman, G., Kim, S., Rexer, J. M., and Thirumurthy, H. (2020). Political partisanship influences
 behavioral responses to governors' recommendations for covid-19 prevention in the united states.
 Proceedings of the National Academy of Sciences 117, 24144–24153
- 340 [Dataset] Hale, T., Webster, S., Petherick, A., Phillips, T., and Kira, B. (2020). Oxford covid-19 government
- 341 response tracker. Data use policy: Creative Commons Attribution CC BY standard
- 342 Hardin, R. (2015). *Collective action* (RFF Press)

- Haushofer, J. and Metcalf, J. (2020). Combining behavioral economics and infectious disease epidemiology
 to mitigate the covid-19 outbreak. *Princeton University, March* 6
- Kahane, L. H. (2021). Politicizing the mask: Political, economic and demographic factors affecting mask
 wearing behavior in the usa. *Eastern Economic Journal*, 1–21
- Krupka, E. and Weber, R. (2013). Identifying social norms using coordination games: Why does dictator
 game sharing vary? *Journal of the European Economic Association* 11, 495–524
- Kushner Gadarian, S., Goodman, S. W., and Pepinsky, T. B. (2020). Partisanship, health behavior, and
 policy attitudes in the early stages of the covid-19 pandemic. *Health Behavior, and Policy Attitudes in the Early Stages of the COVID-19 Pandemic (March 27, 2020)*
- McMichael, A. J., Woodruff, R. E., and Hales, S. (2006). Climate change and human health: present and
 future risks. *The Lancet* 367, 859–869
- Mehta, J., Starmer, C., and Sugden, R. (1994). The nature of salience: An experimental investigation of
 pure coordination games. *The American Economic Review* 84, 658–673
- Milosh, M., Painter, M., Van Dijcke, D., and Wright, A. L. (2020). Unmasking partisanship: How
 polarization influences public responses to collective risk. University of Chicago, Becker Friedman
 Institute for Economics Working Paper 102
- Mobius, M. M., Niederle, M., Niehaus, P., and Rosenblat, T. S. (2011). *Managing self-confidence: Theory and experimental evidence*. Tech. rep., National Bureau of Economic Research
- Nosenzo, D. and Görges, L. (2020). Measuring social norms in economics: Why it is important and how it
 is done. Analyse & Kritik 42, 285–312
- Ostrom, E. (2000). Collective action and the evolution of social norms. *Journal of economic perspectives* 14, 137–158
- [Dataset] Pennycook, G., McPhetres, J., Bago, B., and Rand, D. G. (2021). Beliefs about covid-19 in
 canada, the uk, and the usa: A novel test of political polarization and motivated reasoning
- Pickup, M., Stecula, D., and Van Der Linden, C. (2020). Novel coronavirus, old partisanship: Covid-19
 attitudes and behaviours in the united states and canada. *Canadian Journal of Political Science/Revue canadienne de science politique* 53, 357–364
- Prentice, D. A. and Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: some consequences of misperceiving the social norm. *Journal of personality and social psychology* 64, 243
- Pronin, E., Gilovich, T., and Ross, L. (2004). Objectivity in the eye of the beholder: divergent perceptions
 of bias in self versus others. *Psychological review* 111, 781
- Ross, L., Greene, D., and House, P. (1977). The "false consensus effect": An egocentric bias in social
 perception and attribution processes. *Journal of experimental social psychology* 13, 279–301
- 377 Schelling, T. C. (1980). The strategy of conflict (Harvard university press)
- Sherif, M. (1988). The robbers cave experiment: Intergroup conflict and cooperation.[Orig. pub. as
 Intergroup conflict and group relations] (Wesleyan University Press)
- Shih, M., Pittinsky, T. L., and Trahan, A. (2006). Domain-specific effects of stereotypes on performance.
 Self and Identity 5, 1–14
- 382 Sugden, R. (1995). A theory of focal points. The Economic Journal 105, 533-550
- Tajfel, H., Turner, J. C., Austin, W. G., and Worchel, S. (1979). An integrative theory of intergroup conflict.
 Organizational identity: A reader 56, 9780203505984–16
- 385 Thaler, M. (2021). The supply of motivated beliefs. *arXiv preprint arXiv:2111.06062*
- Van Bavel, J. J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., et al. (2020). Using
 social and behavioural science to support covid-19 pandemic response. *Nature Human Behaviour*, 1–12
- Whitt, S., Wilson, R. K., and Mironova, V. (2021). Inter-group contact and out-group altruism after
- 389 violence. *Journal of Economic Psychology* 86, 102420
- Zhao, E., Wu, Q., Crimmins, E. M., and Ailshire, J. A. (2020). Media trust and infection mitigating
 behaviours during the covid-19 pandemic in the usa. *BMJ global health* 5, e003323

5 TABLES

	Inj. Norm Miscoord.		Desc. Norm Miscoord.	
	(1)	(2)	(3)	(4)
Precautionary Behavior Index	-0.00***	-0.00***	-0.00**	-0.00**
	(-3.17)	(-3.16)	(-2.07)	(-2.13)
Stringency Index	0.00	0.00	-0.00	-0.00
	(1.22)	(0.73)	(-0.60)	(-1.11)
Democrat	0.03	-0.08	-0.01	-0.17
	(1.48)	(-0.65)	(-0.26)	(-1.15)
Republican	0.07	-0.13	0.06	-0.68***
-	(1.48)	(-0.55)	(1.03)	(-3.26)
Stringency Index x Dem.		0.00		0.00
<u> </u>		(0.95)		(1.15)
Stringency Index x Rep.		0.00		0.01***
		(0.81)		(3.57)
Observations	1797	1797	1797	1797
Vuong Statistic		-1.03		-2.37**
		(0.30)		(0.02)
Dem. = Rep.	-0.03	0.06	-0.06	0.51**
	(0.46)	(0.81)	(0.21)	(0.01)
Dem. \times Stringency = Rep. \times Stringency		-0.00		-0.01***
$C \rightarrow 1$	N/	(0.71)	V	(0.00)
Controls	Yes	Yes	Yes	Yes

Table 1. Relationship between Precautionary Behavior, Miscoordination, and Stringency Index

Note: All columns controls. Controls include college, race, major choice, risk tolerance, political party, motivation for precautionary behavior, survey week and state indicators. Estimation includes survey respondent random coefficients. Standard errors are clustered at the survey-respondent level. Coefficients are reported with t-statistics in parentheses. Colinear observations are dropped. The linear combination of marginal effects is reported with p-values in parentheses underneath. * p < 0.1, ** p < 0.05, *** p < 0.01.

6 FIGURES



Figure 1. Injunctive and Descriptive Norm Indices by Wave and Political Identity. Gray areas indicate 95% confidence intervals



Figure 2. Daily Average Stringency Index, Beliefs About Norm Indices, and Precautionary behavior. The straight lines in the graph above correspond to the time periods between the survey waves.