Article

Does State Tightness-Looseness Predict Behavior and Attitudes Early in the COVID-19 Pandemic in the USA?

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Abstract

We investigated how tightness-looseness, reflecting strictness of social norms, of state of residence in the USA predicts behaviors and attitudes related to COVID-19. Because individual-level tightness may better capture current attitudes during the pandemic, whereas state-level archival measures reflect historical factors, we assessed the extent to which tightness-looseness at both levels predicted adherence to public health guidelines and biases toward outgroups related to COVID-19. In Spring 2020, 544 mTurk participants, primarily from the 13 tightest and 13 loosest states, completed survey questions about health behaviors in response to COVID-19, endorsement of future policy changes, feeling of responsibility for lives, and attitudes toward groups marginalized during the pandemic (i.e., Asians, older adults). State-level results indicated some associations with attitudes toward Asians and older adults, but effects were not robust. Results based on individuals' ratings of the tightness of their state indicated that higher levels of perceived tightness were associated with higher levels of protective self-reported public health behaviors (e.g., mask wearing, handwashing) during COVID-19, more endorsement of future policy changes to contain the pandemic, higher reported feelings of responsibility for one's life, and stronger negative attitudes toward Asians. The relations between tightness and health outcomes persisted after controlling for political attitudes and demographics. Thus, individual, more than state, tightness-looseness accounted for some degree of public health behaviors (unique contribution of individual tightness: $R^2 = .034$) and attitudes toward marginalized groups ($R^2 = .020$) early during the COVID-19 pandemic. The implications of these findings for interventions to support behavior change or combat anti-Asian bias are discussed.

Keywords

COVID-19, culture, behavior change, attitudes, outgroup

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During the COVID-19 (SARS-CoV-2) pandemic, social norms emerged as playing an important and sometimes controversial role in the response to the virus in the USA. Initially lacking a coordinated national response, states were left to enact their own policies to limit the spread of the virus, with some requiring mask wearing, lockdowns with closures and restrictions on businesses, and on-line education for public schools (Gershman, 2020; Haffajee & Mello, 2020). Other states imposed minimal restrictions or lifted them early. Although much of the variation in policy and attitudes was attributed to the political leanings of states, with liberal "blue" states enacting more restrictions than conservative "red" states (Nisen & Fizeli, 2020), psychological and sociocultural factors (Dryhurst et al., 2020) could account for differences in perceived threats and attitudes, and consequently shape local policies.

Perceived threats in the form of natural disasters, pathogens, or invasions increase motivations to form and strengthen group ties, acting to reduce threats by increasing group homogeneity and reducing contact with outgroup members (e.g., Boyer et al., 2015). Threats create pressures on groups to form cultural norms to protect themselves, including sanctions of deviant behavior, which help to coordinate social action for survival. In contrast, other groups have encountered few threats and can afford more deviant behavior. Cultural tightness-looseness likely contributes to how efficiently group members cooperate to increase safety. Specifically, cultural tightness-looseness reflects the strictness of norms and expectations for a group and the strength of punishment for violating those norms (Berry, 1966, 1967; Gelfand et al., 2006, 2011, 2017; Pelto, 1968; Triandis, 1989). In industrial societies, tight groups tend to have more authoritarian governments, reduced civil liberties, less religious freedom, more frequent use of the death penalty, and media restrictions (Gelfand et al., 2011; Harrington & Gelfand, 2014).

How might tightness-looseness have shaped responses to the COVID-19 pandemic? Historically, tight societies have faced more threats and thus have evolved to require higher levels of obedience to social norms, leading to different adaptations than looser societies (Gelfand et al., 2017; Harrington & Gelfand, 2014). This may have prepared residents of tight societies to abide by cooperative norms and to feel more accountable, which would help them better prevent illness and transmission of the COVID-19 virus (Gelfand et al., 2017, 2021). Because individuals in tight societies should be more willing to abide by norms, one would have expected greater compliance with rules during the global threat of COVID-19 compared to those in loose societies (Gelfand et al., 2021). The degree of tightness of a society is also expected to shape attitudes toward outgroups. Because cultural tightness is associated with less openness (Gelfand et al., 2017; Harrington & Gelfand, 2014), there is more discrimination and xenophobia in tight societies. Tightness is associated with more dislike of minorities or outgroups, who are perceived as disrupting the social order (Jackson et al., 2019). For this reason, tight societies should have had more negative views of minorities, particularly minorities perceived as implicated in the pandemic. In this study, we assess the contribution of cultural tightness to behaviors, responsibility, and attitudes related to the COVID-19 pandemic in the USA with a focus on health-related behaviors and inter-group attitudes.

Tightness-looseness operates at multiple levels, from nations to regions to communities (Chua et al., 2019; Gelfand et al., 2011, 2017, 2021; Harrington & Gelfand, 2014). Past research addressing variation in tightness-looseness across states in the USA has tended to focus on state tightness scores compiled from archival data, such as rates of shootings, degree of punishment for violating laws, and legality of same-sex marriage (Harrington & Gelfand, 2014). This approach extends to research on COVID-19, which has relied on archival measures to investigate relationships between cultural tightness and the spread and mortality from COVID-19. Contrary to expectations, higher growth rates of infection were reported in states with higher tightness scores during the early period of the pandemic (White & Hébert-Dufresne, 2020), a finding later attributed to greater resistance to adopting COVID-19 preventive behaviors and greater participation in COVID-hotspot events (Althouse et al., 2020). Another approach in measuring cultural

tightness centers on participants' perceptions of their states' and communities' tightness based on responses to survey questions, an approach adopted previously in international comparisons (Gelfand et al., 2011). This approach entails asking people how strongly they agree/disagree with statements like "There are many social norms that people are supposed to abide by in the state you live in" (Harrington & Gelfand, 2014) and it is known that individuals' reports do not always align with state-level archival data. This type of survey-based approach was employed to investigate outcomes from COVID-19 across nations, using scores of tightness from past surveys. The approach showed that tighter nations had lower rates of infections and deaths and more fear of contracting COVID-19 than looser nations (Gelfand et al., 2021).

To investigate the psychological mechanisms driving COVID-19 related preventive behaviors and attitudes, we use both methods: a survey-based approach using individuals' perceptions of their states' tightness, and archival measures of tightness measured at the state level. Individual ratings (Chua et al., 2019; Kleitman et al., 2021), state or nation archival measures (Cao et al., 2020; Gelfand et al., 2021; Harrington & Gelfand, 2014), or both approaches (Gelfand et al., 2011; Jackson et al., 2019) have been used in past research. Both approaches are valuable, and may access somewhat different aspects of tightness. State-level measures reflect overall state-level laws, regulations, and societal standards (e.g., severity of punishment for violating laws) based on objective archival measures. Individual-level measures of state tightness may reflect the subjective view one has of how strict the norms are of their state. The outcome measures in this study reflect individual level assessments of their own behaviors and attitudes, which align better with their ratings of state tightness than archival measures. More importantly, individual-level tightness scores are better able to reflect changes due to current events, such as the COVID-19 pandemic, whereas state-level archival measures reflect the broader historical conditions for a state.

Early in the pandemic (April–May 2020), we assessed how individuals' perceived state tightness as well as archival measures of state tightness correlated with measures of individuals' public health behaviors associated with reducing COVID-19 transmission, feelings of responsibility, and attitudes toward marginalized groups. Using self-reported answers to a questionnaire, we assessed individuals' adherence to public health guidelines, feeling of accountability for saving lives, and outgroup biases related to the COVID-19 pandemic. Tight cultures have been known to feel more fearful, threatened, and hostile toward outgroups (Jackson et al., 2019; van Bavel et al., 2020). We studied attitudes toward older adults and Asians as outgroups due to the relevance of these groups to the COVID-19 pandemic. Older adults had a higher risk of hospitalization and mortality from the virus than younger adults (CDC, 2020). Consequently, some argued that the restrictions imposed through social distancing and lockdowns were safeguards for vulnerable populations including older adults. These measures could operate to increase bias against older adults. Indeed, ageism increased during COVID-19 (Newberry, 2020), rampant in news reports depicting older adults as helpless (e.g., Ayalon, 2020), calls for older adults to make sacrifices for the good of the nation (Hennessy-Fiske, 2020) or policies for rationing care (Couteur et al., 2020; Farrell et al., 2020). The global outbreak of COVID-19 also could have heightened negative attitudes toward Asians. In the USA, Asians were a scapegoat for the spread of the disease, with the first reported cases in Wuhan, China. Some politicians in the USA branded the virus as the "Wuhan" or "Chinese" virus (van Bavel et al., 2020). Incidents of discrimination in the USA against individuals from Asia and the Pacific Islands increased during the pandemic (The Asian Pacific Policy & Planning Council, 2020). The Pew Research Center found that 4 in 10 USA adults believed it is more common to express racist views toward Asians since the pandemic began and 31% of USA Asian adults have been subjected to racist jokes or slurs (Pew Research Center, 2020). With both of these groups at a higher risk for discrimination, we assessed whether self-assessed tightness-looseness predicts bias against older adults and Asians.

We included control variables to reduce the influence of potential confounding factors when assessing the effects of tightness-looseness. Political affiliation was the most important control variable. Although they overlap on some values (e.g., societal order), tightness and political conservatism are distinct constructs (Jost et al., 2003; Kahan et al., 2009, 2011). Later we discuss the reasons for including political affiliation as a control variable in the regressions.

This pre-registered study seeks to understand one factor—state tightness-looseness—that might shape behavior and attitudes during the COVID-19 pandemic in the USA. We hypothesized that individuals from states with high tightness ratings based on archival measures, or who rated their states as tighter in the initial months of the pandemic will (H1a) report more behavioral compliance with COVID-19 public health recommendations, (H1b) express more willingness to change future behaviors and sanction transgressions in response to the threat of COVID-19, feel more responsibility for their own (H1c) and others' (H1d) lives, (H2) report more negative attitudes toward Asians, and (H3) report more negative attitudes toward older adults.

Methods

Participants

Participants were at least 18 years old, USA citizens, and native English speakers. We focused data collection on the 13 loosest and 13 tightest states as defined by Harrington and Gelfand (2014), though the inclusion of additional participants outside of these states is discussed in the Supplemental Materials (see "Participants" section). Table 1 shows demographic information divided by tight and loose states, based on a median split of the state tightness scores from Harrington and Gelfand (2014). Participants were recruited from the Mechanical Turk (MTurk) online platform and completed an online survey in Qualtrics. Data were collected between April 14th, 2020 and May 20th, 2020. We targeted a sample size of 500 eligible participants, a number based on samples in related studies, expected effect sizes, and budget constraint. The final sample used in the analyses consisted of 544 participants. The study was approved by the IRB of Brandeis University and all participants gave documented consent before participating. (See the Supplemental Materials for additional details about recruitment, sampling across states, sample size estimates, and data exclusion in the "Participants" and "Power Analyses" section).

Procedure

Participants first reported the state in which they reside; those in eligible states at that time of data collection were allowed to proceed with the study (see "Participants" section in Supplemental Materials for additional information about sampling). Respondents next completed the Tightness-Looseness scale (Harrington & Gelfand, 2014), and then provided background information on topics summarized in Table 1. Participants subsequently answered questions regarding their current behaviors in response to the COVID-19 pandemic and willingness to change those behaviors, and whether they considered themselves essential personnel (37% essential personnel). Participants then completed subsets of items from the Intergenerational-Tension Ageism Scale (North & Fiske, 2013) and the Attitudes Towards Asians Scale (Ho & Jackson, 2001) to assess biases toward older adults and Asians. Questions and items on scales were presented in the same order across participants. The survey is available at: https://osf.io/k5qz8/ and Appendix A in the Supplemental Materials.

Measures: Predictor Variables

State level. At the state level, we used archival scores of each state's tightness-looseness, taken from Harrington and Gelfand (2014). These scores were calculated based on a number of state-

Table 1. Descriptive Statistics of Demographic and Controls Variables Split Between Tight and Loose States (sensu Harrington & Gelfand, 2014) to Characterize the Sample.

	Loose state (*N* = 266)	Tight state (*N* = 278)
Age		
Mean (*SD*)	36.5 (10.3)	38.1 (10.4)
Median [Min, Max]	34.0 [18.0, 71.0]	35.0 [19.0, 76.0]
Gender		
Male	177 (66.5%)	172 (61.9%)
Female or other	89 (33.5%)	106 (38.1%)
Highest educational attainment		
Less than high school	0 (0%)	1 (0.4%)
High school	21 (7.9%)	21 (7.6%)
Some college, trade or technical school	45 (16.9%)	68 (24.5%)
Bachelor's degree	157 (59.0%)	130 (46.8%)
Master's degree	39 (14.7%)	54 (19.4%)
MD, PhD, other advanced degree	4 (1.5%)	4 (1.4%)
Household income per capita		
Mean (*SD*)	25,900 (17,800)	23,100 (18,200)
Median [Min, Max]	21,900 [2,000, 125,000]	17,500 [2,000, 175,000]
Political affiliation		
Very liberal	51 (19.2%)	43 (15.5%)
Liberal	71 (26.7%)	48 (17.3%)
Neutral	48 (18.0%)	51 (18.3%)
Conservative	59 (22.2%)	88 (31.7%)
Very conservative	37 (13.9%)	48 (17.3%)
Urban/rural area of current residence		
Very urban	80 (30.1%)	69 (24.8%)
Somewhat urban	111 (41.7%)	112 (40.3%)
Somewhat rural	48 (18.0%)	69 (24.8%)
Very rural	27 (10.2%)	28 (10.1%)
Sampling day (after survey started)		
Mean (*SD*)	18.5 (12.0)	18.7 (13.0)
Median [Min, Max]	17.0 [0, 39.0]	16.0 [0, 44.0]
Race		
White/Caucasian	188 (70.7%)	197 (70.9%)
Black/African American	51 (19.2%)	61 (21.9%)
Asian	19 (7.1%)	10 (3.6%)
American Indian/Alaskan Native	5 (1.9%)	3 (1.1%)
Native Hawaiian/Other Pacific Islander	0 (0%)	0 (0%)
Multiracial	2 (0.8%)	6 (2.2%)
Other	1 (0.4%)	1 (0.4%)
Ethnicity		
Not Hispanic	207 (77.8%)	230 (82.7%)
Hispanic	59 (22.2%)	48 (17.3%)
Region of current residence		
Northeast	103 (38.7%)	5 (1.8%)
Midwest	13 (4.9%)	38 (13.7%)
South	2 (0.8%)	235 (84.5%)
West	148 (55.6%)	0 (0%)
Years lived in state		
Mean (*SD*)	25.5 (13.8)	28.0 (14.0)
Median [Min, Max]	28.0 [1.00, 60.0]	30.0 [1.00, 67.00]
Missing	3 (1.1%)	5 (1.8%)

level metrics that reflected the tightness of social norms, including the legality of corporal punishment, rate of executions, legality of same-sex civil unions.

Individual level. At the individual level, the Tightness-Looseness Scale (Harrington & Gelfand, 2014) was used to assess the level to which participants perceived their state to be tight or loose (Cronbach's alpha (α) = .72). The scale measures the degree to which participants agreed, on a 1 (strongly disagree) to 6 (strongly agree) scale, with six statements such as, "There are many social norms that people are supposed to abide by in the state you live in" and "People in this state almost always comply with social norms." Higher scores indicated participants believed their state to be tighter; possible scores ranged 6 to 36 based on summing participants' responses to each item. We did not label the states as "tight" or "loose" or provide information about the state's level of tightness-looseness (e.g., the state's score based on prior archival research), but relied only on participants' responses to the questions to assess the extent to which they perceived their state to be tighter or looser.

Measures: Outcome Variables

Overview. We had six outcomes, corresponding either to health-related variables or attitudes toward marginalized groups. All outcomes were continuous variables.

Health-related variables. A total of four outcome measures assessed health behaviors and responsibility in response to COVID-19. For the first two, we created scales that separately measured (1) the extent to which participants, at the time of the survey, were partaking in certain actions in response to the pandemic (α = .78) and (2) their anticipated future willingness to partake in new actions to help control the pandemic (α = .87). Items were based on CDC recommendations and public health discussions during the time of data collection (CDC, 2020).

The first scale asked participants to rate five statements (e.g., How frequently are you wearing a mask? Hand washing?) on a scale from 0 (never) to 5 (always); possible scores ranged from 0 to 25 based on summing responses to items. See the Supplemental Results ("Missing data" and "Results for the OLS Model using the 10-item COVID-19 health behavior scale" sections) for analyses of the subset of participants who received an expanded 10-item scale[1] (α = .88). The second scale asked participants to rate their support for seven statements (e.g., "Would you stay home for 3 months? Would you take a COVID-19 vaccine?") on a scale from 1 (strongly oppose) to 5 (strongly support); possible scores ranged from 7 to 35 based on summing responses to items. Higher scores on the scales indicated (1) increased support for the behaviors listed and (2) increased endorsement for future change in behavior.

The third and fourth outcomes that assessed health behaviors were based on single items: one that assessed the responsibility felt for one's own life and the second the responsibility felt for others' lives. Possible scores ranged from 1 to 7, rescored so that higher scores indicated a higher sense of responsibility. Factor analyses supported analyzing these two items separately and not combining either with the health behaviors questionnaire (see "Factor Analysis" section of the Supplemental Materials).

Attitudes toward marginalized groups. The scale assessing attitudes toward Asians (Ho & Jackson, 2001) measures anti-Asian bias, assessing both positive (α = .77) and negative (α = .97) attitudes. We used 14 out of 28 questions from the original scale, using the loading factors reported by Ho and Jackson (2001) to determine which items were non-repetitive and most significant for our questions. The positive subscale asks participants to rate three statements such as, "Most Asians are intellectually bright." The negative subscale asks participants to rate 11 statements such as, "Asians are out to drain American resources." Participants responded on a scale from 1 (disagree

Table 2. Descriptive Statistics of Outcome Variables, and Main Predictor, Split by Tight and Loose States (sensu Harrington & Gelfand, 2014).

	Loose state ($N = 266$)	Tight state ($N = 278$)
Individual tightness-looseness (loose 6–36 tight)		
Mean (*SD*)	24.5 (4.43)	25.3 (4.22)
Median [Min, Max]	25.0 [6.0, 34.0]	26.0 [12.0, 36.0]
Outcome		
Health behaviors		
Mean (*SD*)	19.4 (4.52)	19.0 (4.55)
Median [Min, Max]	20.0 [2.00, 25.0]	20.0 [5.00, 25.0]
Responsibility for own life		
Mean (*SD*)	5.15 (1.68)	5.15 (1.73)
Median [Min, Max]	6.00 [1.00, 7.00]	6.00 [1.00, 7.00]
Responsibility for others' lives		
Mean (*SD*)	5.47 (1.73)	5.45 (1.64)
Median [Min, Max]	6.00 [1.00, 7.00]	6.00 [1.00, 7.00]
Endorsement of future policies		
Mean (*SD*)	24.1 (6.39)	23.4 (7.14)
Median [Min, Max]	25.0 [7.00, 35.0]	24.0 [7.00, 25.0]
Negative attitudes toward Asians		
Mean (*SD*)	34.7 (17.1)	33.0 (16.8)
Median [Min, Max]	35.0 [11.0, 70.0]	30.5 [11.0, 66.0]
Negative attitudes toward older adults		
Mean (*SD*)	38.7 (15.6)	36.0 (15.8)
Median [Min, Max]	39.0 [12.0, 72.0]	35.0 [12.0, 69.0]

strongly) to 6 (agree strongly); possible scores ranged from 11 to 66 based on summing responses to items. Analyses focused on the negative scale, as our factor analysis (see "Factor Analysis" section of the Supplemental Materials) and prior literature suggested it was not appropriate to combine scores from the positive and negative subscales.

Negative views of older adults were measured using the Intergenerational-Tension Ageism Scale (North & Fiske, 2013). This scale assesses participants' views on identity and resource consumption and succession in relation to the aging population ($\alpha = .94$). We chose 12 out of 20 statements to include in the present study, based on each statements' relation to hypothesis H3. Participants rated statements such as, "Older people are too big a burden on the healthcare system," on a scale of 1 (strongly disagree)to 6 (strongly agree); possible scores ranged from 12 to 72 based on summing responses to items.

For each of the scales measuring attitudes toward outgroup members, responses were added to create a final score. A higher score indicated the subject had a more negative view of the outgroup. Descriptive statistics for all individual-level outcomes and the main predictor variable are presented in Table 2

Analytic Plan

Correlations. We conducted two types of correlational analyses to assess whether conceptually related questions and outcomes should be treated separately or combined. First, we examined correlations for the individual-level survey measures (1) between answers to questions related to perceived tightness-looseness score and (2) between answers to questions within the following outcomes: (a) health behavior, (b) endorsing future changes, (c) negative attitudes toward Asians,

and (d) responsibility for others' lives (see "Correlations of items and measures" section of Supplemental Materials). Second, we conducted three factor analyses of responses to the three following group of measures: (1) health behaviors scale and responsibility for one's own and others' lives, (2) tight score and political affiliation, and (3) the positive and negative subscales of the attitudes toward Asians scale. Results suggested the six outcome measures should be treated separately (see "Factor Analysis" section in Supplemental Materials).

Overview of analyses of tightness. We next tested the relationship between tightness-looseness and outcome variables using ordinary least squares (OLS) multiple regressions in R version 3.6. This approach was appropriate because outcome variables are continuous and not censored (e.g., not clustered at a minimum or maximum value of the distribution). We did not use standardized beta coefficients because the variables had very different standard deviations (Table 2). We used unstandardized betas with robust standard errors clustered by state to correct for heteroscedasticity and for clustering of observations by states, the primary unit of sampling.

State-level analyses. This analysis tested how archival measures of state tightness (the main predictor) related to the six outcomes described in the "Measures: Outcome variables" section. The results reported here contain a variety of state-level control variables (equation (a)), which were added to the model in stages. (See Supplemental Materials, "State-level model: Analytic Plan").

a. $Y_{ij} = - + b_1 \text{State score}_s + b_2 \text{primary state-level controls}_s + b_3 \text{secondary state-level controls}_s + \varepsilon$

Where Y is the outcome, primary state-level controls include political affiliation (% Democrat) and COVID-19 infection rates, secondary state-level controls—thought to indirectly exert effects on outcomes—were population density and Gini index of state income inequality. The subscript j indexes each of the six outcomes and subscript s refers to states. The error term is assumed to have standard properties.

Control variables. We added multiple control variables at the state level and used robust standard errors and clustering by states for the reasons mentioned above. See Supplemental Materials under "State-level model: Justification and Description of Control Variables."

Individual-level analyses. These models focused on analyses at the level of the individual participant, investigating how each participant's score of perceived tightness-looseness of their state (the main predictor) related to six outcomes (see "Measures: Outcome variables" section).

Control variables: Overview. The analyses included seven control variables (see "Control Variables" section in the Supplemental Materials for additional details, including how variables were coded in analyses).

Control variables: Political affiliation. Among the control variables, political affiliation was particularly important because responses to COVID-19 in the USA have been shaped by political attitudes, with liberals expressing concern about COVID-19 (Christensen et al., 2020) and restricting activities (Clinton et al., 2021) more than conservatives. Moreover, political affiliation shapes views about mask wearing and attribution of blame to China (Van Kessel & Quinn, 2020). In addition, Mturk samples have been shown to be more liberal than the general population, even in predominantly conservative states (DeSoto, 2016). The possible selection bias could affect the representativeness of respondents in each state. To address these potential confounds and because we were primarily interested in testing the effects of tightness-looseness beyond political affiliation, we controlled for political affiliation (see also the "Factor analysis" section of the Supplemental Materials).

Control variables: Other. Other control variables were gender and age, based on potential differences across these groups in perceptions of COVID-19 risk (Barber & Kim, 2021) and compliance with public health recommendations (Lin et al., 2021), as well as likely difference in attitudes toward older adults based on participants' ages. We accounted for *per capita* family income and urban/rural residence, because differences in urban population density could increase the threat of the disease while income tends to protect health. Education was also included based on findings that having a bachelor's degree or higher influenced compliance with guidelines about wearing a face mask (Brenan, 2020). Moreover, both urban locations and attending college might provide more opportunity to interact with Asians and potentially influence attitudes toward this group. Finally, we included the day the participant completed the survey from the launch of the study. This is because the survey ran for over a month (4/13/2020–5/20/2020) during a time in which understanding of and reactions to the pandemic were rapidly changing. Another consideration is that participants from tight states tended to be recruited slower than those from loose states, making it important to account for the progression of the pandemic when comparing effects of tightness-looseness.

Estimator to test hypotheses: Individual level. We estimated the parameters of equations (b)–(e). Bonferroni adjustments were used to correct *p* values for false positives from multiple hypotheses testing. Two models were used for each outcome. The first model (b) examined the contribution of tightness-looseness on its own to outcomes, and the second model (c) controlled for individual-level variables thought to potentially impact outcomes or be confounded with individual-level measures of tightness-looseness.

$$\text{b. } Y_{ij} = \alpha + b\text{Tightness}_i + \varepsilon$$

$$\text{c. } Y_{ij} = \alpha + b\text{Tightness}_i + £\text{individual-level controls}_i + \varepsilon$$

The error term is assumed to have standard properties. The subscript i refers to individuals and the subscript j indexes each outcome.

Combined state + individual analyses. We conducted an additional analysis that combined state and individual-level measures of tightness-looseness into a single model. This allowed us to assess the robustness of our results from the individual-level model. State-level measures could differ from individual level measures if state-level measures are capturing norms about COVID-19, as described in the previous section. In this case, it would be possible for state level measures to produce one set of results and for individual level measures to produce a different set of results. The following two models were used:

$$\text{d. } Y_{ij} = \alpha + b_1\text{Tight score}_i + b_2\text{individual-level control variables}_i + b_3\text{State score}_s + \varepsilon$$

$$\text{e. } Y_{ij} = \alpha + b_1\text{Tight score}_i + b_2\text{individual-level control variables}_i + b_3\text{State score}_s + b_4\text{primary state-level control variables}_s + b_5\text{secondary state-level control variables}_s + \varepsilon$$

Where subscripts i and s refer to individual and state-level variables, the subscript j indexes for the outcomes, and the error term is assumed to have standard properties. Individual-level control variables were political affiliation, gender, education, income, age, how urban/rural participants' locations were, and how many days after the survey was created they participated. Primary state-level control variables were percent Democrat, and percent COVID-19 positive. Secondary state-level control variables were population density and Gini coefficient of state income inequality.

Multi-level modeling. Because the effects of individual-level tightness on outcomes could vary randomly between states, multi-level modeling could be an appropriate method to

Table 3. State-Level Predictors of COVID-19 Behaviors, Biases, and Accountability: Results of OLS Multiple Regressions (equation (a); n = 544).

Outcome	*R*-squared	State score	Percent democrat	Percent COVID positive	Population density	Gini Index
Health behaviors (H1a)	.04	0.01 (0.02)	0.04 (0.06)	0.05 (0.02)	0.002 (0.001)	3.54 (19.30)
Responsibility for own life (H1b)	.005	0.005 (0.01)	0.01 (0.02)	0.01 (0.01)	−0.0003 (0.0004)	−4.03 (5.60)
Responsibility for others' lives (H1b)	.02	0.01 (0.01)	0.02 (0.02)	0.01 (0.01)	0.001** (0.0003)	−10.00 (5.78)
Endorsement of future policies (H1c)	.01	−0.03 (0.03)	−0.01 (0.07)	0.001 (0.03)	0.001 (0.001)	29.45 (15.99)
Negative attitudes toward Asians (H2)	.03	−0.27 (0.11)	−0.56 (0.33)	−0.12 (0.07)	−0.003 (0.01)	219.32* (7.22)
Negative attitudes toward older adults (H3)	.03	−0.29 (0.11)	−0.61 (0.33)	−0.13 (0.08)	0.002 (0.01)	196.15* (71.41)

Note. Values in parentheses below the estimate represent the Standard Error (*SE*). *SE* are clustered by state. *p*-Values are adjusted for multiple comparisons. *$p < .05$ **$p < .01$ Betas reported are unstandardized due to clustering.
The regression for negative attitudes toward Asians includes the percent of the population that is Asian as an added control variable.
State Score represents the states' tight score from Harrington and Gelfand (2014).
Percent Democrat represents the state average of Democratic party affiliation.
Percent COVID Positive represents percentage of positive COVID cases per state from 1/22/20to 5/2/20.
Population Density was calculated by dividing the state population by the state area (square miles).
Gini coefficient is an indicator of state income inequality.

combine state- and individual-level results. However, the interclass correlation coefficients (ICC) of outcome variables with state as a nested factor were low (each ICC $\leq .11$), indicating that only a small amount of the variation in outcomes could be explained by states. For this reason, we only report the outcome of this analysis in the Supplemental Materials. See "Results of multi-level modeling" and "Summary of findings of HLM" in the Supplemental Materials.

Results

State-Level Results

State score was not a significant predictor of any outcome variables ($ps \geq .06$).[2] The only control variables significant in any of the models were population density (for responsibility for others' lives) and the Gini coefficient of state income inequality (for attitudes toward Asians and older adults). See Table 3 for a summary of results for state-level regression.

Individual-Level Results

We present results in two steps. First, in Figure 1 we show the results of bivariate analysis (equation (b)), with 95% confidence intervals in gray. These result show that participants' rating of the tightness-looseness of their state, or tight score, was a significant predictor for health behaviors during COVID-19 ($b = 0.19$, $t(542) = 4.05$, $p = .0001$), responsibility taken for own life ($b = 0.04$, $t(542) = 2.32$, $p = .04$), endorsement of future policy changes ($b = 0.20$, $t(542) = 2.57$, $p = .02$), and negative attitudes toward Asians ($b = 0.78$, $t(542) = 3.91$, $p = .0002$).[3] Perceived tightness was not a significant predictor for responsibility for others' lives ($b = 0.03$, $t(542) = 1.27$, $p = .41$, or negative attitudes toward older adults ($b = 0.38$, $t(542) = 2.08$, $p = .07$).[4]

In the second step we show the results of multivariate regression (Table 4). These results show that when adding control variables (equation (c)), perceived tightness remained a significant predictor for three of the four significant findings described above. Specifically, perceived

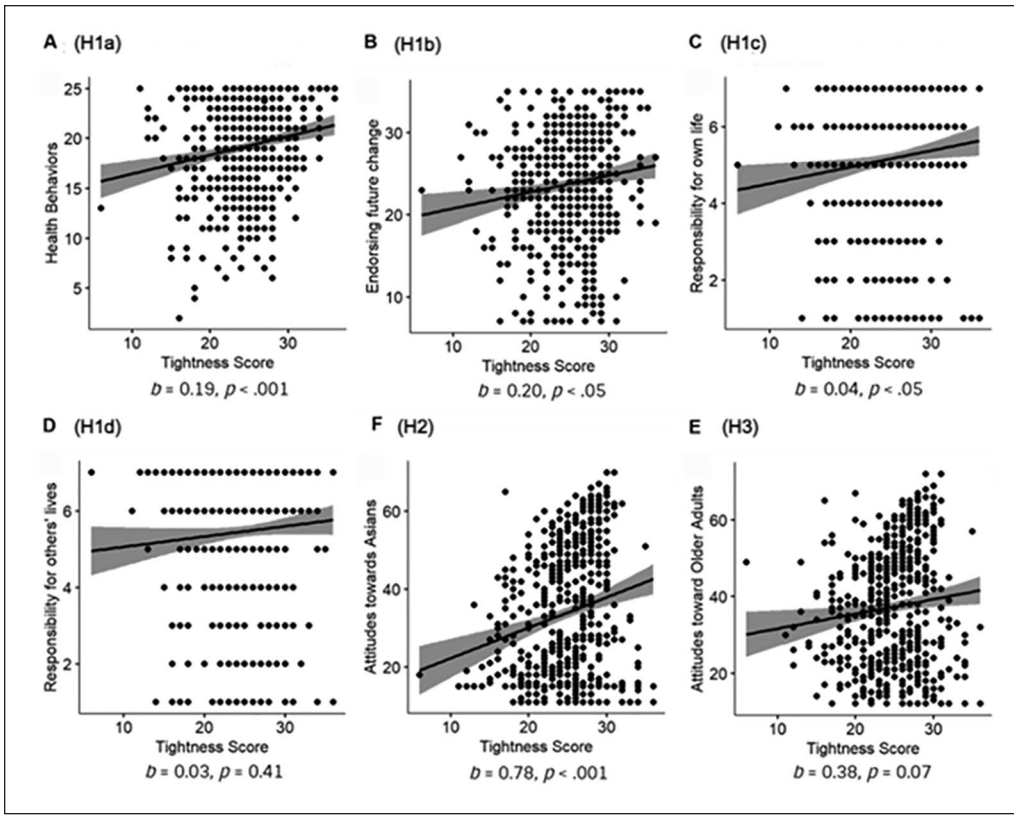

Figure 1. Scatterplots depicting the relationship between tightness-looseness and each of the six outcome variables (reported as raw scores for each measure). The gray shading around the regression line reflects the 95% CI. The statistics reflect the strength of the relationship when only tightness-looseness was entered in the model (equation (b)) and include Bonferroni adjustments for statistical significance for multiple comparisons. Significant *p*-values are indicated using conventional cut-offs (e.g., $p < .05$; $p < .001$); exact values are reported for non-significant effects. See Table 4 for values when control variables are entered in the model (equation (c)).

tightness predicted health behaviors during COVID-19 ($b = 0.21$, $t(535) = 5.27$, $p = .000001$), responsibility taken for one's own life ($b = 0.05$, $t(535) = 2.81$, $p = .04$), and endorsement of future policies ($b = 0.20$, $t(535) = 2.98$, $p = .03$). Perceived tightness no longer significantly predicted negative attitudes toward Asians ($b = 0.431$, $t(535) = 2.68$, $p = .07$).

In addition, there were a number of significant associations between control variables and outcomes. Most notably, political affiliation was positively associated with all outcome variables (i.e., those who reported being more conservative reported less endorsement of COVID-19 health behaviors, future policies, and less feeling of responsibility for one's own as well as others' lives, as well as reporting more negative attitudes toward older adults and Asians). Nevertheless, the reported effects of tightness emerge in the model in spite of the strong effects of political affiliation.

To provide an estimate of the amount of variance uniquely explained by individual levels of tightness, we first calculated R^2 values for models (a) including only the individual-level control variables (e.g., education, age; those listed in Table 5), excluding political affiliation and tightness. We then compared the model to two additional models, which included (b) individual

Table 4. Individual-Level Predictors of COVID Behaviors, Biases, and Accountability: Result of OLS Multiple Regressions (equation (c), $n = 544$).

Outcomes and hypotheses	*R*-squared	Tight score	Political affiliation	Gender	Education	Household income	Age	Urban/rural	Sampling day
Health behaviors (H1a)	.09	0.21*** (0.04)	−0.63*** (0.14)	0.98 (0.38)	0.31 (0.24)	0.04 (0.19)	0.02 (0.02)	0.13 (0.23)	−0.02 (0.01)
Endorsement of future policies (H1b)	.11	0.20* (0.07)	−1.09*** (0.22)	0.10 (0.54)	1.71*** (0.43)	−0.55 (0.32)	−0.05 (0.03)	−0.20 (0.33)	0.02 (0.02)
Responsibility for own life (H1c)	.05	0.05* (0.02)	−0.20* (0.06)	0.14 (0.13)	0.022 (0.08)	−0.02 (0.07)	0.01 (0.01)	−0.02 (0.09)	−0.01 (0.01)
Responsibility for others' lives (H1d)	.08	0.04 (0.02)	−0.28*** (0.05)	0.11 (0.14)	0.05 (0.10)	0.04 (0.08)	0.004 (0.01)	0.07 (0.08)	−0.02 (0.01)
Negative attitudes toward Asians (H2)	.45	0.41 (0.15)	4.81*** (0.50)	−4.32 (1.59)	4.45*** (0.97)	−2.71*** (0.63)	−0.10 (0.06)	−0.91 (0.52)	0.26*** (0.06)
Negative attitudes toward older adults (H3)	.32	0.15 (0.15)	2.02*** (0.48)	−6.34*** (1.30)	4.29*** (0.85)	−2.16** (0.62)	−0.26*** (0.06)	−0.48 (0.60)	0.22*** (0.05)

Note. Unstandardized betas are reported (see "Analytic Plan" section of main body for explanation). Values in parentheses are robust standard error (*SE*) clustered by state. *p*-Values adjusted for multiple comparisons. Regression includes constant (not shown). *$p < .05$. **$p < .01$. ***$p < .001$.

For the regression analyses, predictor variables were coded as follows (see Supplemental Materials for description of original scales for recoded variables):

Tight score: Higher scores reflect higher levels of tightness, based on individuals' ratings of their state.

Political affiliation was rated on a scale of 1 (very liberal) to 5 (very conservative)

Gender (Male) was recoded into a binary where 0 = male and 1 = female or neither.

Education was coded as 1 < high school, 2 = high school, 3 = some college, trade, technical, or business school, etc. 4 = Bachelor's degree, 5 = Master's degree, and 6 = MD, PhD, or other advanced degree.

Income represents adjusted family income (income divided by the number of people in the household). Reported income values were split into quartiles, with the lowest quartile coded as 1.

Urban/Rural was coded as 1 = very urban, 2 = somewhat urban, 3 = somewhat rural, and 4 = very rural.

tightness or (c) political affiliation. The change in R^2 values for models b and c compared to model a provided estimates of the unique contributions of tightness and political affiliation.

The effect sizes for tightness indicate that effects are closer to small than medium in size for the relevant outcome measures. For health behaviors during COVID-19, individual tightness is uniquely associated with $R^2 = .034$ (above the contribution of control variables). In comparison, political affiliation is uniquely associated with $R^2 = .025$ (above the contribution of control variables). For endorsement of future policy changes, individual tightness is uniquely associated with $R^2 = .011$ and political affiliation is associated with $R^2 = .037$. For negative attitudes toward Asians, individual tightness is associated with $R^2 = .020$ and political affiliation uniquely associated with $R^2 = .14$. For responsibility for one's own life, individual tightness is uniquely associated with $R^2 = .013$ and political affiliation is uniquely associated with $R^2 = .019$.

The effects reported above represent the *unique* effect of individual perceived tightness, and we report the unique effects of political affiliation for comparisons. Many of the demographic variables that we control for in the model are associated with tendency to endorse tightness in everyday settings. These comparisons indicate that for some outcomes, such as health behaviors during COVID-19, individual levels of tightness explain more variance than outcomes such as political affiliation. However, for other outcomes, such as negative attitudes toward Asians, political affiliation plays a larger role than individual tightness. The large contribution of political affiliation, alongside that of other demographics variables, likely contributes to the limited contribution of individual tightness to negative attitudes toward Asians when all control variables are entered into the model. We will further consider the meaningfulness of these effects in the discussion.

Individual-Level and State-Level Combined Results

In the model containing both levels of tightness scores, as well as control variables at the individual and state level (equation (e)), results generally reflected contributions from individual-, but not state-, level tightness scores (Table 5). Individual tightness was a significant predictor of health behaviors during COVID-19 ($b = 0.20$) and negative attitudes toward Asians ($b = 0.45$). As before (Table 3), state-level tightness scores did not predict health behavior outcomes. However, in this model the negative associations between state tightness and negative attitudes toward Asians ($b = -0.25$, $t(532) = -4.80$, $p = .00002$) and negative attitudes toward older adults ($b = -0.23$, $t(532) = -3.26$, $p = .02$) were statistically significant.

Discussion

Summary

In this study, we found some evidence that higher levels of tightness, measured at the level of the state, predicted more favorable attitudes toward Asians and older adults (Table 5). However, these relationships only emerged as significant in the model containing both individual and state tightness scores and primary and secondary control variables; none of the effects reached significance in the model with state tightness scores alone (Table 3). In contrast, individual-level ratings of state tightness were associated with many outcomes across multiple models. Those individuals who rated their states as tighter reported more endorsement of health behaviors during COVID-19 (H1a), more endorsement of future policies to combat the COVID-19 pandemic (H1b), more responsibility for one's own life (H1c), and more negative attitudes toward Asians (H2) (Figure 1). The associations with health behaviors, but not negative attitudes toward Asians, remained significant after controlling for a host of variables (Table 4), including political affiliation. Furthermore, the association between individual tightness scores and endorsement of health

Table 5. State and Individual-Level Tightness Predicting COVID-19 Behaviors, Biases, and Accountability: Results of OLS Multiple Regressions (equation (e); $n = 544$) .

Outcome	Model *R*-squared	Individual tightness	State tightness	Political affiliation	Gender	Education	Household income	Age	Urban/Rural	Sampling day	Percent democrat	Percent COVID positive	Population density	Gini Index
Health Behaviors (H1a)	.12	0.20*** (0.04)	−0.002 (0.02)	−0.58*** (0.14)	1.02 (0.39)	0.29 (0.23)	0.03 (0.19)	0.02 (0.02)	0.15 (0.23)	−0.01 (0.01)	0.01 (0.06)	0.04 (0.02)	0.001 (0.009)	9.27 (19.76)
Responsibility for own life (H1b)	.05	0.05 (0.02)	0.002 (0.006)	−0.20* (0.06)	0.14 (0.13)	0.02 (0.08)	−0.03 (0.07)	0.01 (0.01)	−0.02 (0.09)	−0.01 (0.01)	−0.0004 (0.01)	0.01 (0.01)	0.0002 (0.0004)	−2.49 (5.23)
Responsibility for others' lives (H1b)	.09	0.04 (0.02)	0.01 (0.006)	−0.27*** (0.05)	0.10 (0.14)	0.06 (0.10)	0.02 (0.08)	0.004 (0.006)	0.05 (0.08)	−0.02 (0.01)	0.01 (0.01)	−0.001 (0.007)	0.001 (0.0003)	−6.23 (5.00)
Endorsement of future policies (H1c)	.12	0.20 (0.07)	−0.02 (0.02)	−1.05*** (0.22)	0.14 (0.54)	1.71** (0.44)	−0.56 (0.33)	−0.05 (0.02)	−0.17 (0.33)	0.02 (0.02)	−0.02 (0.07)	0.002 (0.02)	0.002 (0.001)	13.57 (14.12)
Negative attitudes toward Asians (H2)	.47	0.45* (0.16)	−0.25*** (0.05)	4.96*** (0.48)	−4.07 (1.54)	4.41*** (0.94)	−2.73*** (0.59)	−0.08 (0.05)	−0.64 (0.59)	0.26*** (0.05)	−0.40 (0.15)	0.03 (0.05)	−0.001 (0.003)	78.62 (43.92)
Negative attitudes toward older adults (H3)	.34	0.17 (0.15)	−0.23* (0.07)	2.11*** (0.43)	−6.13*** (1.22)	4.32*** (0.84)	−2.21** (0.59)	−0.23*** (0.05)	−0.24 (0.62)	0.22*** (0.05)	−0.45 (0.21)	−0.04 (0.07)	0.004 (0.004)	84.25 (55.77)

Note. Values in parentheses below the estimate represent the Standard Error (*SE*). *SE* are clustered by state. Betas are unstandardized due to clustering. *p*-Values adjusted for multiple comparisons. *$p < .05$. **$p < .01$. ***$p < .001$.

This table compares tightness at the individual level to tightness at the state level.

Individual Tightness represents participants' scores from the Harrington and Gelfand (2014) Tightness-Looseness measure, where a higher score means a participant believes their state has tighter values.

State tightness represents the states' tight score from Harrington and Gelfand (2014).

behaviors during COVID-19 and negative attitudes toward Asians persisted when state tightness and control variables were included in the model (Table 5).

Implications of Findings

The relationship between individual-level tightness and public health behaviors could impact the course of the pandemic and the health and well-being of individuals. Examination of COVID-19 infection and death rates found that nations that had higher levels of tightness faced fewer COVID-19 cases and deaths than nations that had lower levels of tightness (Gelfand et al., 2021), or lower prevalence and mortality rates (Cao et al., 2020). People in tight nations also reported higher levels of fear of contracting COVID-19 compared to those in looser nations, consistent with our finding that individuals who perceived their states as tight reported performing more public health behaviors in response to COVID-19. At the level of the individual, individuals sampled from the US, Canada, UK, and Australia who reported being looser were less compliant with recommendations for protective behaviors during COVID-19 (Kleitman et al., 2021). Our research extends prior results by focusing on US states, considering both individual perceptions and archival measures of state tightness. Results indicate that individual perceptions of state tightness are associated with health behaviors and attitudes toward Asians.

Explaining Null State Effects

We did not find state-level effects regarding health behaviors, and there was weak evidence for an effect on attitudes. The absence of these state-level effects is surprising given the effects at the level of nations (Gelfand et al., 2021). More generally, our state-level results may be influenced by sampling; the study may be underpowered in states with very few participants, there was uneven sampling of participants across states, and recruited participants may not representative of the state. The unique number of states in our sample ($n = 26$) was small relative to the sample size of participants. After including state-level control variables, we might not have enough unique observations of states to separate the effect of state-level tightness from other state-level traits.

Relationship Between State and Individual Constructs of Tightness

Although the effects differ across the state and individual levels, it is difficult to reconcile the patterns due to the sampling limitations discussed above. Should future studies with large, representative samples find diverging effects at the state and individual-levels, that would raise concerns about the robustness of the measure of tightness. The "Policy" section considers potential challenges in implementing interventions, should state- and individual- tightness operate differently.

Attitudes toward Asians

In terms of negative attitudes toward Asians, these represent threat to and rejection of members of a marginalized group, consistent with the scapegoating of China and use of the term "China virus" to blame the country where the virus was first reported. These tendencies may have been particularly strong early in the pandemic, when our data were collected (April–May 2020). Negative attitudes also can have public policy implications (Maurer et al., 1996). Because stereotypes about outgroups can impact public policy stances (e.g., the closing of restaurants, mandated mask wearing and social distancing), the attitudes can impact how one judges the appropriateness of adhering to or violating policies (e.g., punishments of non-mask wearers).

Although we find an association between individual tightness and negative attitudes toward Asians, this becomes non-significant when control variables are included in the model. Variables such as political affiliation, education, and household income had strong associations with attitudes toward Asians. Thus, it may be the case that individual tightness plays a smaller role than other demographics characteristics on attitudes or that individual tightness only has a strong relationship with attitudes toward Asians in particular demographic groups.

In addition, results of Table 5 indicate that state-level measures of tightness are associated with *less* negative attitudes toward Asians, a pattern going in the opposite direction of the individual-level results and our expectations. It is worth noting that tightness scores are strongly negative correlated with the percent of the state population that is Asian ($r = -.52$). Due to these findings, the percent of Asians in each state's population is included as a covariate in the HLM model (see Supplemental Materials). This unexpected finding could reflect a random oddity or our failure to control for relevant mediating variables at the individual or state level.

Interpreting Effect Sizes

Across health behaviors and attitudes, how meaningful are these associations between individual tightness scores and outcomes? We answer this question by examining the change in outcome scores from moving from the loosest possible score (6) to the tightest possible score (36), and we include estimates of effect sizes in *SD* units. On average, moving from loosest to tightest would represent 6.3-point gains in both health behaviors and endorsement of future behaviors, equivalent to endorsing 1 level higher (e.g., moving from "about half the time" to "most of the time" for each item on the measures) and, respectively, changes of 1.39 and 0.88 in *SD* units for each measure. The change across levels of tightness in reporting a greater sense of responsibility for one's own life represents a 1.5 point change, equivalent to 0.88 in *SD* units. These could represent substantial changes in compliance with public health recommendations and a sense of responsibility for one's behavior, decreasing the risk of virus transmission through mask wearing, handwashing, and social distancing. In terms of negative attitudes toward Asians, the 12.3-point increase in negative attitudes that would be associated with moving from the loosest to the tightest score would represent endorsing each item on the measure more strongly (e.g., moving from a rating of 3 to 4 on the 6-point scale), and is equivalent to a change of 0.73 in *SD* units. Negative attitudes toward Asians could be associated with heightened bias and discriminatory actions toward the group, as well as increasing Asians' discomfort and fear for their safety.

The Role of Political Affiliation

Beyond tightness-looseness, it is worth considering what can be learned from control variables. Even after controlling for tightness, political affiliation had strong relationships with outcomes such that those who reported being more conservative reported being less likely to engage in health behaviors or endorse future policies, feeling less responsibility for one's own or others' lives, as well as having more negative attitudes toward Asians and older adults. The effects of political affiliation have been widely discussed and have shaped states' responses to the pandemic (Christensen et al., 2020; Clinton et al., 2021; Nisen & Fizeli, 2020; Van Kessel & Quinn, 2020). Our results suggest that tightness-looseness contributes to behaviors and attitudes beyond the effects of an individual's political affiliation; for some outcomes, such as attitudes toward Asians, the effects of political affiliation are much larger whereas for others, such as health behaviors during COVID-19, individuals' level of tightness explains more variance.

Policy

The results of our study suggest that tightness-looseness might be a unique psychological factor that should be considered in attempting to change public health behaviors and in tailoring messages about the pandemic to be aligned with individuals' motivations (van Bavel et al., 2020). For example, encouraging mask-wearing or vaccination using public appeals focused on social norms might be particularly effective for individuals who perceive their communities as tight due to societal standards around punishment and rule enforcement, but other strategies may be needed for individuals who perceive their communities as loose. Potential discrepancies between state and individual-level results could make it challenging to implement, in that it would be necessary to identify and target communities in which individuals share similar attitudes about tightness. In addition, awareness of the importance of tightness-looseness and social norms could help to identify communities potentially at heightened risk of anti-Asian attitudes in order to combat bias, though the contributions of demographics and state-level variables could make it challenging to predict which communities are most at risk.

Limitations and Future Research

A limitation of the research is that for self-report data without experimental manipulations, we cannot infer casual relationships. Like any observational study, this one cannot control for the nearly infinite set of mediating variables that affect results, such as biases from sample selection or omitted variables at the level of individuals or states.

The study points to several promising future lines of research, some of which could redress the limitations just noted. First, our results come from one country and predominantly well-educated White adults; furthermore, mTurk samples can be non-representative of the population (Chmielewski & Kucker, 2020; DeSoto, 2016). To assess the external validity of our findings, a larger, more representative sample from the USA is warranted, as well as data from other nations (e.g., Bohannon, 2016; Mandel & Realo, 2015; Wagner & Zick, 1995). Because our sample over-represents middle-aged white males and excludes individuals who are not English speakers, the application of our findings to other groups could be limited. For example, public health messaging about COVID-19 recommendations may not have reached non-English speakers as effectively as it did English speakers or the construct of tightness-looseness may be considered differently by women or racial minorities. Although we account for gender and age in our model, it is possible that the results based on smaller samples are not representative of these groups. Second, this study assessed the influence of tightness-looseness during the initial months of the pandemic. Whether such relationships emerge during later stages of the pandemic, as initial fear of the virus subsides and people are less compliant with recommendations, is unknown. Third, the threat of COVID-19 provides a unique opportunity to assess how tightness-looseness changes in response to threats. One would hazard to hypothesize that the threat would lead to convergence in tightness (Murray & Schaller, 2012). Cultures and individuals who already score high in tightness would not have much room to change in response to threats since they already scored high, whereas individuals and groups who score low in tightness-looseness would have more room to become tighter. If Gelfand's theory is correct, the gap in tightness-looseness between individuals and groups should wane as ecological threats grow. Fourth, because we used a non-experimental cross-sectional sample, we could not establish causal effects. Future research could redress the limitation by following the same individuals over time to investigate behaviors and attitudes during times of threat compared to baseline, to remove the role of individual traits that do not vary in time but which might bias cross-sectional estimates. Future research might also be able to use valid instrumental variables for tightness (e.g., Chua et al., 2019) to enhance claims of causal effects.

In conclusion, tightness-looseness is a construct distinct from political attitudes that contributes to public health behaviors and attitudes during COVID-19. Harnessing an understanding of this cultural view could help to increase the effectiveness of public health messaging and compliance by appealing to individuals' allegiance to social norms, as well as identifying individuals and communities potentially at heightened risk of anti-Asian bias.

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Supplemental Material

Supplemental material for this article is available online.

Notes

1. The effect of tightness was generally consistent across the 5 and 10-item measures when control variables were included in the model. See Supplemental Materials.
2. Health behaviors: $b=0.01$, $t(538)=0.51$, $p=1.00$; Endorsement of future policies: $b=-0.03$, $t(538)=-1.03$, $p=1.00$; Negative attitudes toward Asians: $b=-0.27$, $t(538)=-2.52$, $p=.07$; Negative attitudes toward older adults: $b=-0.29$, $t(538)=-2.57$, $p=.06$; Responsibility for own life: $b=0.005$, $t(538)=0.74$, $p=1.00$; Responsibility for others' lives: $b=0.01$, $t(538)=1.75$, $p=.48$).
3. Effects remain significant when outliers (>3 *SD* from the mean; $n=2$ for tightness scores; $n=3$ for health behaviors during COVID-19) are removed from the models. In addition, individual tightness significantly predicts responsibility taken for others' lives ($b=0.04$, $SE=0.02$, $p=.03$) when the outliers are removed.
4. When the data are not corrected for multiple comparisons, the bivariate association between negative attitudes toward older adults and tight score is significant (p=.04). However, when control variables are added in the model (second step), the effect is no longer significant.

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