

**We Need Tough Brothers and Sisters in a Tight World: Cultural Tightness Leads to a
Preference for Dominant and Muscular Leaders**

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Abstract

Cultural tightness is characterized by strong norms and harsh punishments for deviant behaviors. We hypothesized that followers in tight (versus loose) cultures would more strongly prefer muscular leaders. This hypothesis was confirmed across seven studies ($N = 1615$) employing samples from the United States, the United Kingdom, and China. Using actual political leaders, we demonstrated that the tighter the state's culture was, the more muscular the elected governor was (Study 1). Temporarily situating participants in a tight (versus loose) culture made them select a leader higher on muscularity but not on body fat, and the effects obtained occurred for both male and female leaders (Studies 2-3B). In addition, we demonstrated the mediating role of authoritarianism and a preference for a dominant leadership in this process (Studies 4-5B). These results demonstrate the importance of considering the interface between culture and the physical appearance of leaders.

Keywords: Cultural tightness, authoritarianism, leadership preference, body muscularity, dominance

We Need Tough Brothers and Sisters in a Tight World: Cultural Tightness Leads to a Preference for Dominant and Muscular Leaders

Leader–follower structure is a universal feature among human societies (van Vugt et al., 2008). Meanwhile, a society with a tight culture is characterized by having strong norms and employing harsh punishments for deviant behaviors (Gelfand et al., 2006). Given that leaders possess a disproportionate influence on group dynamics, they can be crucial in formulating and enforcing norms (van Vugt & Spisak, 2008). However, how cultural tightness affects followers' leader preference has received very little attention (except Aktas et al., 2016; Stamkou et al., 2019).

One of the key issues when considering the interface of culture and leadership is how dominant a leader is. Dominant leadership refers to exerting influence and control over others via offensive or coercive capacity based on strength, tough-mindedness, or even threats and exploitation (Kakkar & Sivanathan, 2017). Today, there is a resurgence of dominant leadership in both the West and the East. Take the United States as an example, the former governor of New York State, *Andrew Cuomo*, as well as the current governors of Florida and Texas, *Ron DeSantis* and *Greg Abbott*, are well-known for their assertiveness and dominance (e.g., Barkan, 2020; Texas Monthly, 2021; The New Yorker, 2022).

Culture should influence followers' leader preferences in line with the demands of the social context. In the current research, we aimed to test whether living in a tight culture would make people choose to unconditionally conform with their leaders and thus prefer dominant leaders capable of enforcing rules and norms. The preference for dominant leadership in a tight culture could further translate into desiring leaders with a muscular body, the physical embodiment of dominance. That is, followers may *heuristically* associate *body muscularity* with dominant leadership, using leaders' muscularity as a proxy for dominance and assertiveness.

Cultural Tightness and Authoritarianism

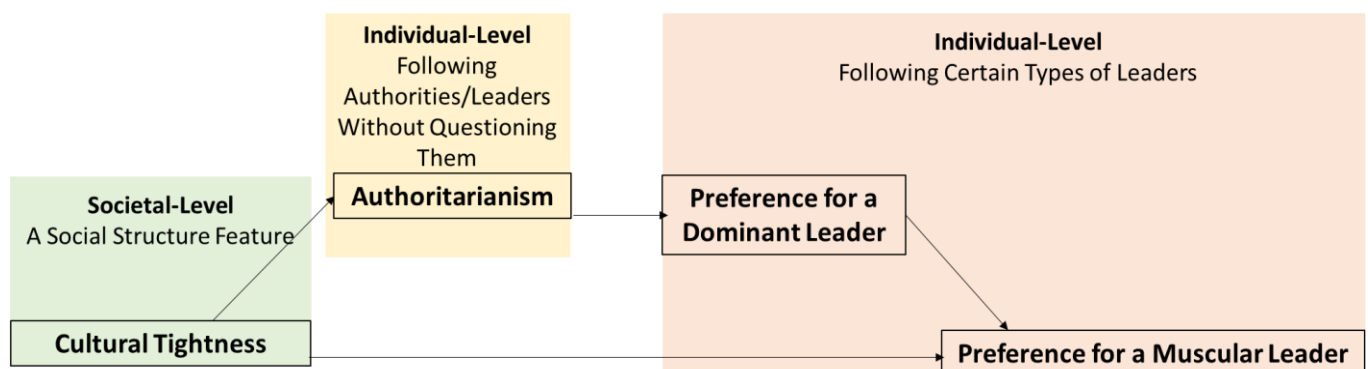
Human social coordination is facilitated by shared social norms concerning how people ought to behave. Although social norms are ubiquitous, the degree to which individuals endorse norms, regulate their behavior, and punish those who do not adhere to norms varies from culture to culture (e.g., Gelfand et al., 2011). To date, a growing body of empirical evidence has documented that cultural tightness affects personality (higher in conscientiousness and agreeableness and lower in openness; Harrington & Gelfand, 2014) and self-perception (e.g., higher in self-regulation strength and self-monitoring and lower in self-humanity and independent self-concepts; Carpenter, 2000; Wang et al., 2023), as well as economic and commercial practices (e.g., higher endorsement of isolationist economic practices and policies and more advertising themes emphasizing prevention and uniformity; Harrington & Gelfand, 2014; Li et al., 2017).

Meanwhile, authoritarianism is characterized by high obedience and respect toward established and legitimized authorities, aggressive behavior toward those sanctioned by authorities, and high adherence to conventions endorsed by authorities (Altemeyer, 1996; Duckitt et al., 2010). In other words, individuals high in authoritarianism endorse or even conform unconditionally to (the policies and practices of) authoritarian and high-power figures (e.g., Manson, 2020). Although authoritarianism can be found in both left-wing and right-wing groups (e.g., Conway et al., 2018; Costello et al., 2022), much of the existing research has focused on right-wing authoritarianism (RWA; Conway et al., 2021). Importantly, recent work has proposed that authoritarianism (or RWA) is better regarded as a set of beliefs or attitudes than a stable personality trait (Duckitt, 1989; Stenner, 2005).

In our case, it is possible that cultural tightness, as a macro-level and external societal feature, could trigger authoritarianism, an individual-level belief, among followers. First, orderliness, regulations, and sanctions are core features of a tight culture (e.g., Chen et al.,

2021). For instance, governments in tight cultures usually have more law enforcement agencies, exercise more control over media, and impose more constraints on civil liberties (Gelfand et al., 2011). Importantly, authority figures and leaders can be critical in formulating social norms, enforcing rules, and sanctioning behaviors that violate norms (van Vugt & Spisak, 2008). As a result, not conforming to authority figures in a tight culture, to a large extent, implies not obeying the rules and regulations in a society. This would further lead to severe punishments. Second, as followers, individuals in tight societies should be more likely to grant and justify authorities' power. This is because orderliness and sanctions can be effectively implemented by power hierarchies (e.g., Ronay et al., 2012), and authorities' power (at least to some extent) is to preserve and enforce norms and enable the punishment of deviant behaviors. Conforming with authorities and leaders facilitates social operation and functioning in a tight culture. Taken together, we believe that cultural tightness could foster authoritarianism (see Figure 1).

Figure 1. *Theoretical Framework of the Current Research*



Cultural Tightness, Authoritarianism, and a Preference for Dominant Leaders

Dominant leadership refers to exerting influence and control over subordinates via offensive or coercive capacity based on strength, decisiveness, tough-mindedness, or even threats and exploitation (Kakkar & Sivanathan, 2017). Dominant leaders employ superior fighting ability, force, and aggression (Garfield et al., 2019), and individuals with this leadership style tend to have greater negotiation capacity (Haselhuhn et al., 2014). If

individuals choose to unconditionally conform to their leaders in a tight culture, they could then be more willing to support mighty and dominant leaders. In other words, tight cultures are more likely to produce authoritarians, and authoritarians ought to be especially likely to prefer dominant leaders. Although conflicts of interest are inherent to group living and can lead to internal divisions (Shah et al., 2021), this could especially be the case in a tight culture, given its strict norms, regulations, and sanctions. Dominant individuals are more likely to intervene in various disputes or conflicts (Hershcovis et al., 2017), being able to ensure their decisions will be abided by, and deviant behaviors will be sanctioned. In other words, such a leadership style enforces regulations and maintains orderliness (Kümmerli, 2011). As a result, dominant leaders relying on toughness and assertiveness can be effective and thus be preferred by conforming followers in a tight culture.

A recent study showed that respondents in tighter cultures strongly prefer norm followers as leaders (Stankou et al., 2019), probably because these leaders can reinforce existing rules and regulations. More direct support is provided by analysis across 29 countries and showed that cultural tightness is positively related to the endorsement of autonomous leadership, which focuses on leadership independence and not relying on others to make decisions (Aktas et al., 2016). Autonomous leadership is linked with dominant leadership; however, the latter can go one step further by using threats and intimidation. In the current research, we argue that heightened authoritarianism in a tight culture could lead followers to prefer a dominant leader, which further makes them favor a leader with muscularity.

Muscularity as a Heuristic Cue for Dominant Leadership

Individuals' positions within a social hierarchy can be formed by various forms of competition, with success (often) being determined by dominance (Mazur & Booth, 1998). Thus, people are sensitive to physical cues associated with dominance, including facial features (e.g., wide jaw and chin, thick brows, and high facial width-to-height ratio; Alrajih &

Ward, 2014; Carrier & Morgan, 2015) as well as voice and speech (e.g., lower vocal pitch, increased interruption of others, longer waiting time to respond; Carney et al., 2005; Hall et al., 2005). Such links have also been consistently demonstrated in leadership studies in which the impression of dominance in potential leaders is formed on the basis of facial and vocal cues (e.g., Laustsen et al., 2015; Wang et al., 2018).

Relatively few studies on leadership have paid attention to body muscularity. Muscularity predicts strength and formidability, both objectively and subjectively (Munoz-Reyes et al., 2019), and physical strength has been a determining factor in dominance (Lukaszewski et al., 2016). Therefore, it is possible that people use muscularity as a physical cue for dominance and dominant leadership. Some empirical studies have consistently demonstrated that muscularity increases perceived dominance (Frederick et al., 2007; Frederick & Hasselton, 2007). Further preliminary evidence on leadership studies has suggested the desirability of muscularity in a leader's physical body; this could be because people intuitively use body strength as an indicator of overall leadership ability and especially dominant leadership style (Lukaszewski et al., 2016). However, to date, there is no scientific evidence showing that muscular people indeed possess better leadership skills. Still, it is possible that followers use leaders' muscularity as a heuristic physical cue for a target's dominant leadership style, a possibility to be examined in the current research.

The Present Research

In the current research, we aimed to investigate whether people in tight (vs. loose) cultures would show a stronger preference for leaders with a muscular body, the embodiment of dominant leadership. This proposed effect ought to be accounted for by the endorsement of authoritarianism (Figure 1). To this end, we conducted seven studies: one correlational study with elected political leaders in the real world (Study 1) and six controlled experiments that employed different methods to manipulate cultural tightness (Studies 2-5B). The studies

examined the gender generalizability of the effects (the body preference for both male and female leaders, Studies 2-5B), boundary conditions (body muscularity versus body fat, Studies 2-5B; the body preference for leaders versus peers, Studies 3A-4), and mechanisms that could account for the effects (authoritarianism and a preference for dominant leadership, Studies 4-5B). In addition, we aimed to test the prevalence of the hypothesized effect by employing participants from the United States (Studies 2, 3A, 4, and 5A), the United Kingdom (Study 3B), and China (Study 5B).

Sample Size Determination

The current rule of thumb for experiments is at least 50 participants per condition (Faul et al., 2007). To increase our power, we aimed for twice as many participants per condition (i.e., 100 participants) for Studies 2–4, following similar prior studies (e.g., Wang, Chen, Chen, & Yang, 2021; Wang, Chen, Krumhuber, & Chen, 2021). For Studies 5A and 5B, we aimed for 200 participants per condition given the planned sequential mediation model. Sensitivity power analyses revealed that minimum effect sizes of $f = .20$ (Study 2, $N = 202$), $f = .20$ (Study 3A, $N = 202$; Study 3B, $N = 205$), $f = .20$ (Study 4, $N = 203$), and $f = .14$ (Study 5A, $N = 402$; Study 5B, $N = 401$) could be detected for the main effect of tightness on body muscularity (ANOVA, main effects), respectively. The actual effects identified across experiments were indeed within this range.

Study 1

Study 1 aimed to test the association between cultural tightness and body muscularity of actual political leaders. To this end, full body standing images of governors from 50 U.S. states were presented to a sample of participants, who evaluated each image for muscularity level. We hypothesized that the governors from tight states would be more likely to possess a muscular body compared to those in loose states.

Method

Cultural Tightness (Predictor)

State-level scores of cultural tightness of 50 U.S. states were sourced from Harrington and Gelfand (2014). This composite index reflects state-wide variation in tightness across the U.S., captured by multiple factors (e.g., harsh punishment of norm violation, restrictiveness, and institutions enforcing social order). We reported all manipulations, measures, and exclusions in these studies. Ethics approval was obtained from the first author's institution. For all studies, participants were compensated with a small amount of money at the end of the study. The data of the current research can be accessed via https://osf.io/g3xhy/?view_only=79321eeb964145879e0eef18bf9be55a

Governors' Muscularity (Outcome Variable)

Governors' Body Images. First, a list of leaders who served as governors of 50 U.S. states from 2014 to 2021¹ was collected from the National Governors Association (NGA)², including 102 governors (88 men and 14 women). Due to the obvious bias in the number of male and female governors, we only considered male governors to control for the confounding factor of gender (i.e., men are usually more muscular than women). Then, a research assistant who was blind to the hypothesis searched for full-body images these governors in the image function of Google.com by entering the keywords "male governor's name" (such as "Asa Hutchinson") or "male governor's name + governor" (such as "Asa Hutchinson governor"). A total of 125 qualified full-body images of 78 male governors in 48 states were obtained (see Supplementary Materials for the full list and selection criteria).

Figure 2. An Example of a Governor Body Image Used in Study 1

¹ The time period from 2014 to 2021 was selected because the years for collecting the predictor (i.e., cultural tightness) should precede that of the outcome variables (i.e., governors' body muscularity).

² <https://www.nga.org/>



Muscularity Rating. Thirty-eight Caucasian participants were recruited from Cloud Research (previously known as Turk Prime; Litman et al., 2017). We only included Caucasian participants because the majority of the targets were also Caucasian. Three participants failed attention check questions and this left a total of 35 participants (16 women, $M = 38.11$, $SD = 10.31$) in the final analysis.

Participants were asked to focus only on the body shape (rather than height or clothes) of the target and to be as accurate as possible. In particular, they answered one question: “How muscular does this person appear to be?” (1 = much less than average; 7 = much more than average). We averaged the rating scores across the raters for each image ($\alpha = .95$), with higher scores corresponding to higher levels of muscularity.

Control Variables

These included state-level cultural, ecological, and sociodemographic factors: collectivism (Vandello & Cohen, 1999), horizontal legal restriction (Conway et al., 2006),

risks of pathogen and disease (Fincher & Thornhill, 2012), cumulative ecological stress (Conway et al., 2017), economic development (GDP per capita), urbanization (the percentage of the total population in urban areas), and proportion of immigrants (the percentage of the total population that is foreign-born). The data of the latter three variables were obtained from American Community Survey (ACS). We also ensured the time period of these control variables were as close as possible to that of the cultural tightness data (i.e., the predictor). Whenever necessary, data were normalized. All data were standardized.

Results and Discussion

To test the robustness of the effect, we adopted three units of analysis: the image, the governors' identity, and the governors' represented state. For the latter two units, we averaged the rating scores across corresponding images and across corresponding images and governors, respectively.

The results showed that the correlation between muscularity and tightness was significant: $r(125) = .28, p = .001$ (image as the analysis unit); $r(78) = .28, p = .014$ (identity as the analysis unit); $r(48) = .37, p = .010$ (state as the analysis unit).

Furthermore, we examined cultural tightness's unique contribution to muscularity. Due to statistic collinearity, we entered each control variable in a separate regression model. The results showed that tightness was significantly associated with muscularity after controlling for collectivism ($B_{\text{tightness}} = 0.44, t = 3.36, p = .002$), horizontal legal restrictions ($B_{\text{tightness}} = 0.30, t = 2.22, p = .032$), risks of pathogen and disease ($B_{\text{tightness}} = 0.38, t = 2.32, p = .025$), cumulative ecological stress ($B_{\text{tightness}} = 0.38, t = 2.81, p = .007$), GDP per capita ($B_{\text{tightness}} = 0.35, t = 2.31, p = .026$), urbanization ($B_{\text{tightness}} = 0.32, t = 2.17, p = .035$), and proportion of immigrants ($B_{\text{tightness}} = 0.33, t = 2.14, p = .038$).

Therefore, Study 1 showed that the tighter a state's culture was, the more muscular the elected governor was. However, Study 1 is subject to several limitations. First, the effect

demonstrated is a small. Second, we only included male leaders due to the obvious bias in the number of male and female governors. Third, the demonstrated relationship is correlational. We aimed to address these limitations in our following studies.

Study 2

Study 2 aimed to test the causal effect of cultural tightness on body preferences in leaders. We predicted that 1) temporarily situating participants in a tight (versus loose) culture would make them prefer a leader higher on muscularity, and 2) this preference would occur for both male and female leaders. For the control measure, we were interested in determining whether this enhanced preference is absent for the body fat dimension. Given that previous research has found that body fat is often associated with traits unrelated or (even) reversely related to dominance, such as weakness, laziness, and immaturity (Dijker et al., 2017; Puhl & Heuer, 2009), we predicted that cultural tightness would not affect the preference for body fat.

Method

Participants

Two hundred and seven Caucasian American participants were recruited from Cloud Research. Five participants failed attention check questions and this left a total of 202 participants (109 women, $M = 40.96$, $SD = 12.38$) in the final analysis. Participants were randomly assigned to either a tightness or a looseness condition, resulting in approximately 100 participants in each condition.

Procedure and Measures

To manipulate cultural tightness, we adapted a well-validated experimental paradigm (e.g., Blake & Brooks, 2019; Wang et al., 2022). Participants were first presented with a virtual scenario that had realistic significance and were asked to imagine themselves living in the world that was depicted as vividly as possible. Specifically, participants were told that in

2208, natural resources on Earth have been depleted. As a result, they and a few other remaining humans have been sent to a newly discovered planet. In the tightness condition, participants were told, “For a society to be successful, it should be built on a foundation of law and order. Therefore, the new society should have strong social norms and deviant behaviors should be punished.” In contrast, participants in the looseness condition were told, “For a society to be successful, it should be built on a foundation of freedom and openness. Therefore, although the new society can have norms, deviant behaviors should be tolerated.” In addition, participants were required to mark the rules from a corresponding list that they would like their new society to adopt (see Supplementary Materials). To strengthen the manipulation, participants were further asked to write down a few suggestions that could reinforce the foundation of law and order (tightness condition) or freedom and openness (looseness condition). Please see a pilot study that validated this method in Supplementary Materials.

To measure body size preference, participants were asked to choose a body that they believed a leader in this society should possess. For the male leader, they were asked to indicate the ideal body shape on the Body Image Matrix of Thinness and Muscularity—Male Bodies (Arkenau et al., 2020), a two-dimensional figure rating scale consisting of 64 3D male bodies that has been validated among Caucasian participants. Specifically, the bodies were presented in an 8×8 grid, with muscularity increasing stepwise on the vertical axis and body fat increasing stepwise on the horizontal axis. For the female leader, participants were asked to indicate an ideal body shape on a comparable Body Image Matrix (see Figure 3; Chen et al., 2021). Preference scores were coded separately for two dimensions, ranging from 1 to 8 with higher scores corresponding to higher levels on that dimension.

As a control measure, participants indicated their present body shape using the same scale. Demographic information, including gender, age, education level, income, perceived

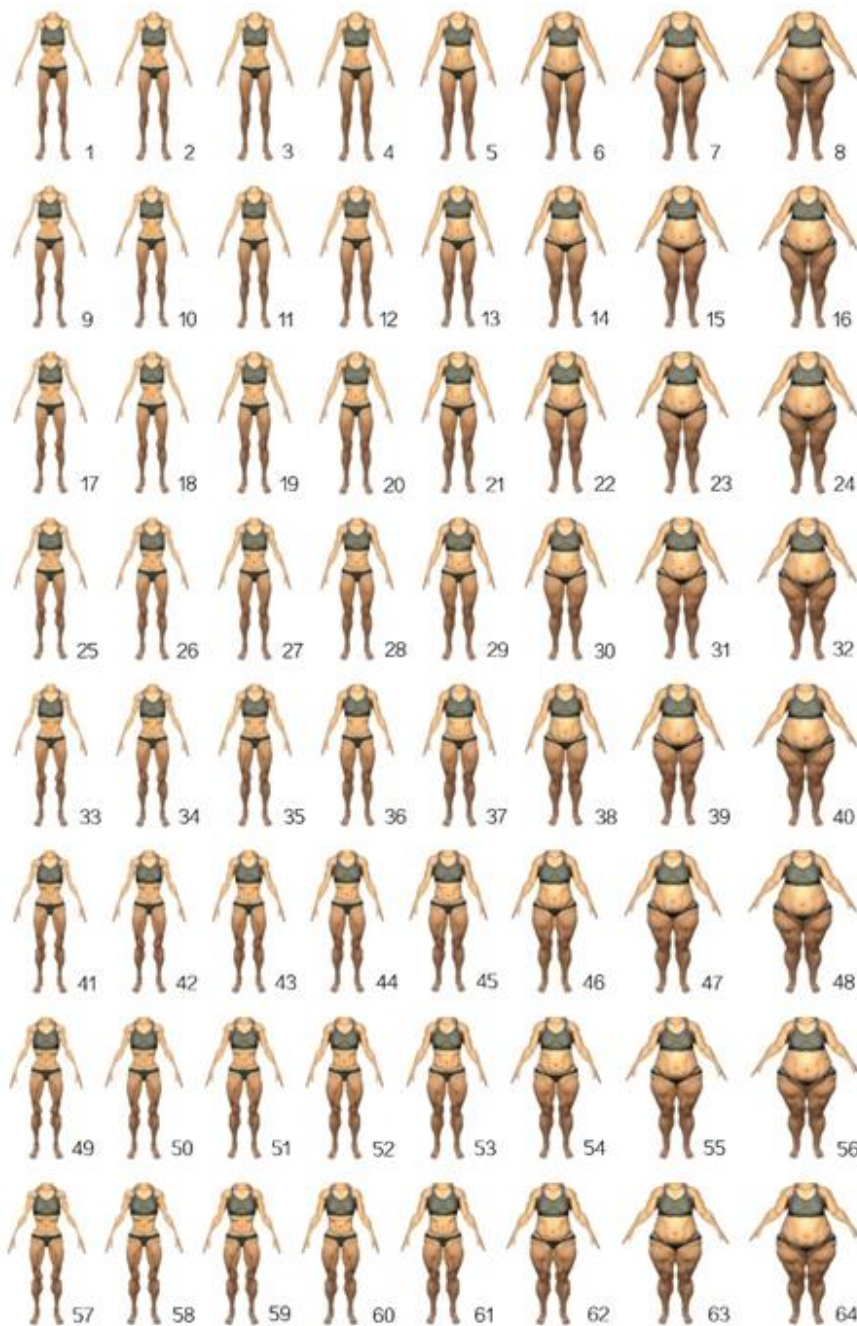
social rank, and sexual orientation, was collected before participants were thanked and debriefed.

Results and Discussion.

A mixed-model ANOVA with type (muscularity vs. fat) as a within-subjects factor and condition (tightness vs. looseness) as a between-subjects factor revealed a significant interaction between type and condition for both male ($F(1, 200) = 8.37, p = .004, \eta_p^2 = .040$) and female leaders ($F(1, 200) = 6.20, p = .014, \eta_p^2 = .030$). See Supplementary Materials for exploratory analysis. Further analysis³ showed that participants in the tightness condition ($M_{\text{male_leader}} = 3.68, SD_{\text{male_leader}} = 1.91; M_{\text{female_leader}} = 3.56, SD_{\text{female_leader}} = 1.79$) preferred a more muscular body shape for both their male ($F(1, 200) = 9.03, p = .003, \eta_p^2 = .043, 95\% \text{ CI} = [0.26, 1.26]$) and female leaders ($F(1, 200) = 6.52, p = .011, \eta_p^2 = .032, 95\% \text{ CI} = [0.15, 1.17]$) compared to those in the looseness condition ($M_{\text{male_leader}} = 2.92, SD_{\text{male_leader}} = 1.69; M_{\text{female_leader}} = 2.90, SD_{\text{female_leader}} = 1.87$; See Figure 4). This remained the case after controlling for gender, current body shape, income, education level, perceived social rank, and sexual orientation, $F(1, 193) = 6.82, p = .010, \eta_p^2 = .034, 95\% \text{ CI} = [0.16, 1.14]$; $F(1, 193) = 5.76, p = .017, \eta_p^2 = .029, 95\% \text{ CI} = [0.11, 1.13]$, respectively. In contrast, cultural tightness did not significantly affect participants' preference for male and female leaders' body fat (male leader: $M_{\text{looseness}} = 4.59, SD_{\text{looseness}} = 1.08$ vs. $M_{\text{tightness}} = 4.45, SD_{\text{tightness}} = 1.08$; female leader: $M_{\text{looseness}} = 5.02, SD_{\text{looseness}} = 1.06$ vs. $M_{\text{tightness}} = 4.89, SD_{\text{tightness}} = 0.81$), $F(1, 200) = 0.83, p = .365, \eta_p^2 = .004, 95\% \text{ CI} = [-0.44, 0.16]$; $F(1, 200) = 0.97, p = .326, \eta_p^2 = .005, 95\% \text{ CI} = [-0.40, 0.13]$, respectively. These findings demonstrated that cultural tightness increased the preference for muscularity but not body fat in leaders.

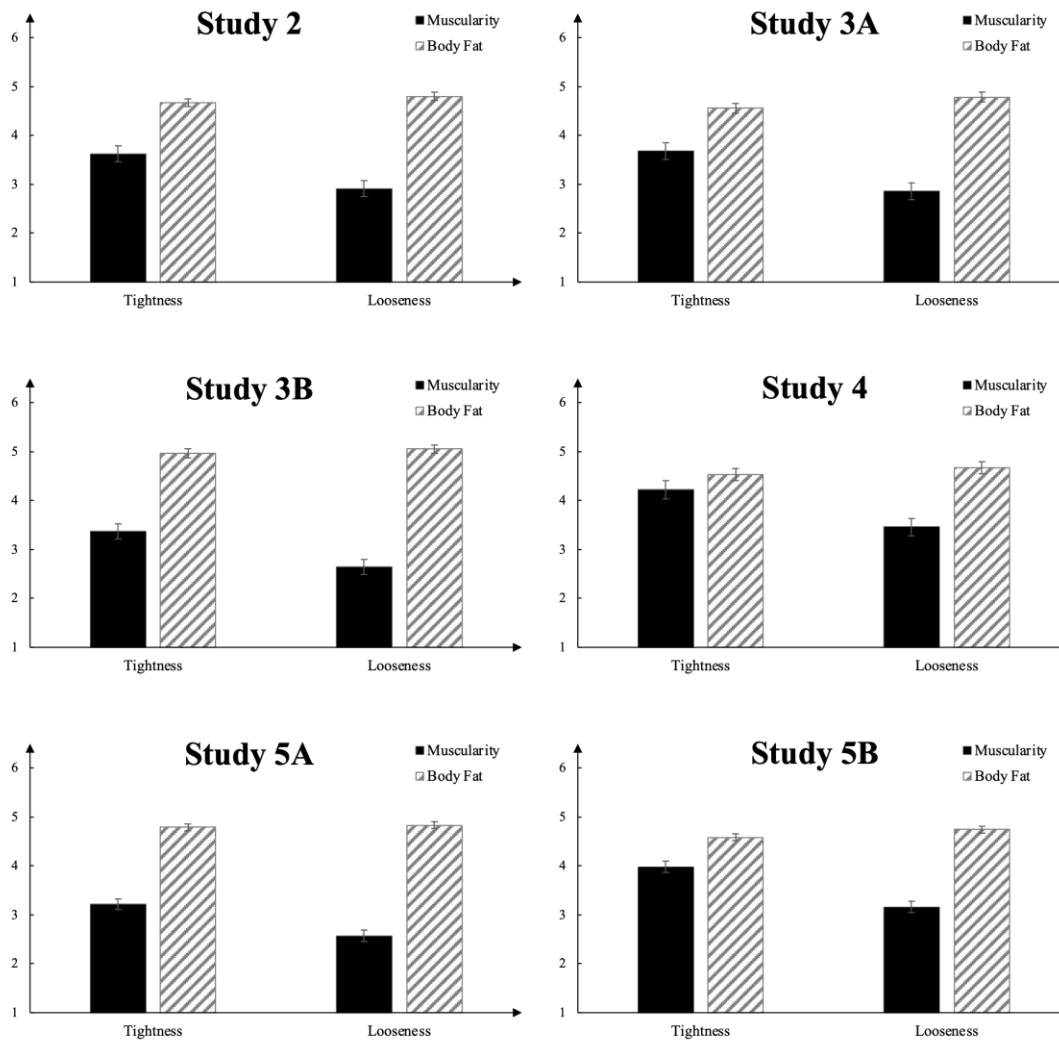
³For further analysis, unless stated otherwise, univariate analyses with condition (tightness vs. looseness) as a between-subjects variable were used. When controlling for variables, univariate analyses with condition (tightness vs. looseness) as a between-subjects variable and control variables as covariates were used.

Figure 3. *The Female Version of the Body Image Matrix of Thinness and Muscularity*



Note. Muscularity increases stepwise on the vertical axis and body fat increases stepwise on the horizontal axis (Chen et al., 2021). For the comparable male version, see Arkenau et al. (2020).

Figure 4. *Participants' Preference for Leaders' Muscularity and Body Fat as a Function of Condition (Tightness vs. Looseness)*



Note. Error bars represent +/- 1SE.

Study 3A

Studies 3A and 3B had three aims. First, they aimed to replicate the findings of Study 2 using a different manipulation method of cultural tightness. Second, to rule out the possibility that cultural tightness could affect muscle preferences more generally, a measure of the body preference for average others was included. Third, we aimed to test the

prevalence of this effect by recruiting participants from the United States (Study 3A) and the United Kingdom (Study 3B).

Method

Participants

Two hundred and ten Caucasian American participants were recruited from Cloud Research. Eight participants failed attention check questions and this left a total of 202 participants (125 women; $M = 42.75$, $SD = 13.81$) in the final analysis. Participants were randomly assigned to either a tightness or a looseness condition, resulting in approximately 100 participants in each condition.

Procedure and Measures

To manipulate cultural tightness, participants were first presented with a writing task. Following Jackson et al. (2021), in the tightness (looseness) condition, participants were asked to read a short paragraph attributing the success of the United States to its strong foundation of law and order (freedom and openness). To increase the power of the manipulation, participants in the tightness (looseness) condition were required to personally endorse up to three elements of current American society that “preserve law and order (preserve freedom and openness).” Please see a pilot study that validated this method in Supplementary Materials. In other words, this approach allowed us to temporarily shift participants’ support of cultural tightness.

Using the same scales as Study 2, participants indicated their preferred body size of their leaders and general others (i.e., peers) living in the United States. Specifically, participants were asked to indicate 1) the body shape they preferred for their male and female leaders, and 2) the body shape they preferred for an average person of the same sex living in the United States. The order of the questions was counterbalanced across participants.

Finally, participants reported their demographic information (e.g., gender and age) before they were thanked and debriefed.

Results and Discussion.

A mixed-model ANOVA with type (muscularity vs. fat) as a within-subjects factor and condition (tightness vs. looseness) as a between-subjects factor revealed a significant interaction between type and condition for both male ($F(1, 200) = 6.54, p = .011, \eta_p^2 = .032$) and female leaders ($F(1, 200) = 11.76, p = .001, \eta_p^2 = .056$). See Supplementary Materials for exploratory analysis. Further analysis showed that participants in the tightness condition ($M_{\text{male_leader}} = 3.78, SD_{\text{male_leader}} = 2.03; M_{\text{female_leader}} = 3.58, SD_{\text{female_leader}} = 1.96$) preferred a more muscular body shape for both their male ($F(1, 200) = 6.51, p = .011, \eta_p^2 = .032, 95\% \text{ CI} = [0.16, 1.21]$) and female leaders ($F(1, 200) = 13.56, p < .001, \eta_p^2 = .063, 95\% \text{ CI} = [0.45, 1.49]$) than those in the looseness condition ($M_{\text{male_leader}} = 3.10, SD_{\text{male_leader}} = 1.77; M_{\text{female_leader}} = 2.61, SD_{\text{female_leader}} = 1.77$; See Figure 4). This remained the case after controlling for the body shape selected for peers, gender, income, education level, and perceived social rank, $F(1, 194) = 8.40, p = .004, \eta_p^2 = .041, 95\% \text{ CI} = [0.24, 1.26]$; $F(1, 194) = 16.86, p < .001, \eta_p^2 = .080, 95\% \text{ CI} = [0.54, 1.54]$, respectively. In contrast, cultural tightness did not significantly affect participants' preference for either male or female leaders' body fat (male leader: $M_{\text{looseness}} = 4.70, SD_{\text{looseness}} = 1.19$ vs. $M_{\text{tightness}} = 4.50, SD_{\text{tightness}} = 1.21$; female leader: $M_{\text{looseness}} = 4.86, SD_{\text{looseness}} = 1.22$ vs. $M_{\text{tightness}} = 4.62, SD_{\text{tightness}} = 1.18$), $F(1, 200) = 1.40, p = .238, \eta_p^2 = .007, 95\% \text{ CI} = [-0.53, 0.13]$; $F(1, 200) = 2.06, p = .153, \eta_p^2 = .010, 95\% \text{ CI} = [-0.58, 0.09]$, respectively.

A mixed-model ANOVA with target (same-sex leader vs. same-sex peers) as a within-subjects factor and condition (tightness vs. looseness) as a between-subjects factor revealed a significant interaction between target and condition ($F(1, 200) = 12.54, p < .001, \eta_p^2 = .059$). Although cultural tightness increased participants' preference for leaders'

muscularity as mentioned above, participants in the tightness condition ($M = 2.12$, $SD = 1.22$) did not necessarily prefer their peers to be more muscular than those in the looseness condition ($M = 2.23$, $SD = 1.44$; $F(1, 200) = 0.36$ $p = .550$, $\eta_p^2 = .002$, 95% CI = [-0.48, 0.26]). These findings demonstrated that cultural tightness increased the preference for muscularity but not body fat in leaders. In contrast, this effect did not generalize to the body preference for their peers.

Study 3B

Method

Participants

Two hundred and eight British residents were recruited from Prolific. Three participants failed attention check questions and this left a total of 205 participants (132 women; $M = 43.62$, $SD = 15.08$; 88% White British, 4% Asian British, 4% African British, and 4% Other) in the final analysis. Participants were randomly assigned to either a tightness or a looseness condition, resulting in approximately 100 participants in each condition.

Procedure and Measures

The manipulation method and procedure were identical to Study 3A except for one change--the short paragraph attributed the success of the United Kingdom (instead of the United States) to its strong foundation of law and order (tightness condition) or freedom and openness (looseness condition). Please see Supplementary Materials for a pilot study that validated this method.

Results and Discussion

A mixed-model ANOVA with type (muscularity vs. fat) as a within-subjects factor and condition (tightness vs. looseness) as a between-subjects factor revealed a significant interaction between type and condition for both male ($F(1, 203) = 7.18$, $p = .008$, $\eta_p^2 = .034$) and female leaders ($F(1, 203) = 7.99$, $p = .005$, $\eta_p^2 = .038$). See Supplementary Materials for

exploratory analysis. Further analysis showed that participants in the tightness condition ($M_{\text{male_leader}} = 3.49$, $SD_{\text{male_leader}} = 1.85$; $M_{\text{female_leader}} = 3.25$, $SD_{\text{female_leader}} = 1.88$) preferred a more muscular body shape for both their male ($F(1, 203) = 11.54$, $p = .001$, $\eta_p^2 = .054$, 95% CI = [0.34, 1.27]) and female leaders ($F(1, 203) = 7.07$, $p = .008$, $\eta_p^2 = .034$, 95% CI = [0.17, 1.13]) than those in the looseness condition ($M_{\text{male_leader}} = 2.69$, $SD_{\text{male_leader}} = 1.50$; $M_{\text{female_leader}} = 2.60$, $SD_{\text{female_leader}} = 1.59$; See Figure 4). This remained the case after controlling for body shape selected for an average person, gender, income, education level, and perceived social rank, $F(1, 198) = 17.99$, $p < .001$, $\eta_p^2 = .083$, 95% CI = [0.38, 1.04]; $F(1, 198) = 8.88$, $p = .003$, $\eta_p^2 = .043$, 95% CI = [0.20, 0.99], respectively. In contrast, cultural tightness did not significantly affect participants' preference for either male or female leaders' body fat (male leader: $M_{\text{looseness}} = 4.81$, $SD_{\text{looseness}} = 1.13$ vs. $M_{\text{tightness}} = 4.78$, $SD_{\text{tightness}} = 1.10$; female leader: $M_{\text{looseness}} = 5.28$, $SD_{\text{looseness}} = 0.98$ vs. $M_{\text{tightness}} = 5.14$, $SD_{\text{tightness}} = 0.83$; $F(1, 203) = 0.03$, $p = .873$, $\eta_p^2 = .000$, 95% CI = [-0.28, 0.33]; $F(1, 203) = 1.24$, $p = .266$, $\eta_p^2 = .006$, 95% CI = [-0.11, 0.39], respectively).

A mixed-model ANOVA with target (same-sex leader vs. same-sex peers) as a within-subjects factor and condition (tightness vs. looseness) as a between-subjects factor revealed a significant interaction between target and condition ($F(1, 203) = 7.28$, $p = .008$, $\eta_p^2 = .035$). Although cultural tightness increased participants' preference for leaders' muscularity as mentioned above, people in the tightness condition ($M = 3.19$, $SD = 1.74$) did not necessarily prefer their peers to be more muscular than those in the looseness condition ($M = 3.07$, $SD = 1.86$; $F(1, 203) = 0.22$, $p = .639$, $\eta_p^2 = .001$, 95% CI = [-0.61, 0.38]).

Therefore, Study 3B replicated the findings of Study 3A using a sample from the United Kingdom.

Study 4

Studies 2 and 3 converged to demonstrate a causal effect of cultural tightness on muscularity preferences for leaders' bodies. Study 4 aimed to directly test the mediating role of a preference for dominant (but not prestigious) leadership in this process. Specifically, we hypothesized that the preference for muscular leaders in tight cultures occurs because muscular leaders are perceived as more dominant compared to leaders who are less muscular. In contrast, we expected muscularity to be unrelated to a second basis of hierarchy – prestige. This is because prestige refers to persuasive capacity based on knowledge, skills, and expertise rather than strength, threats, or intimidation (Kakkar & Sivanathan, 2017).

Method

Participants

Two hundred and nine Caucasian American participants were recruited from Cloud Research. Six participants failed attention check questions and this left a total of 203 participants (102 women; $M = 41.37$, $SD = 13.41$) in the final analysis. Participants were randomly assigned to either a tightness or a looseness condition, resulting in approximately 100 participants in each condition.

Procedure and Measures

To manipulate cultural tightness, we used the same paradigm as Wang et al. (2023, Study 4). Specifically, participants were presented with a scenario where they were asked to imagine themselves living in a newly discovered community as vividly as possible. The community in tightness (looseness) condition was described as having many (very few) social norms and severe punishments (no severe punishments) for deviant behaviors.

We measured people's preference for a dominant and a prestigious leader using an adapted Dominance-Prestige Scale (Cheng et al., 2010). Example items measuring dominance included the following: "As a Tekkier, I would like my leader to control others rather than permit others to control him/her" and "As a Tekkier, I would like my leader to let

others know it is better to let him/her have his/her way.” Example items measuring prestige included the following: “As a Tekkier, I would like members of my peer group to respect and admire my leader” and “As a Tekkier, I would like my leader’s unique talents and abilities to be recognized by others.” The overall dominance and prestige scores were calculated by averaging the corresponding items, with higher scores corresponding to higher levels on that dimension (dominance: $\alpha = .89$; prestige: $\alpha = .88$).

Using the same scales as Studies 2 and 3, participants indicated the preferred body size of their leaders and general others (i.e., peers) living in their community. The order of the preference for leadership style (i.e., dominant and prestige) and the preference for body size was counterbalanced across participants.

Finally, participants reported their demographic information (i.e., gender and age) before they were thanked and debriefed.

Results and Discussion

A mixed-model ANOVA with type (muscularity vs. fat) as a within-subjects factor and condition (tightness vs. looseness) as a between-subjects factor revealed a significant interaction between type and condition for both male and female leaders, $F(1, 201) = 4.07, p = .045, \eta_p^2 = .020$; $F(1, 201) = 10.69, p = .001, \eta_p^2 = .051$), respectively. Further analysis showed that participants in the tightness condition ($M_{\text{male_leader}} = 4.57, SD_{\text{male_leader}} = 2.00$; $M_{\text{female_leader}} = 3.87, SD_{\text{female_leader}} = 1.87$), compared to the looseness condition ($M_{\text{male_leader}} = 3.78, SD_{\text{male_leader}} = 2.08$; $M_{\text{female_leader}} = 3.14, SD_{\text{female_leader}} = 1.85$), preferred a more muscular body shape for both their male and female leaders, $F(1, 201) = 7.69, p = .006, \eta_p^2 = .037, 95\% \text{ CI} = [0.30, 1.36]$; $F(1, 201) = 7.93, p = .005, \eta_p^2 = .038, 95\% \text{ CI} = [0.22, 1.25]$, respectively (See Figure 4). Consistent with prior findings, cultural tightness did not significantly affect participants’ preference for both male and female leaders’ body fat (male leader: $M_{\text{looseness}} = 4.35, SD_{\text{looseness}} = 1.66$ vs. $M_{\text{tightness}} = 4.35, SD_{\text{tightness}} = 1.43$; female leader: $M_{\text{looseness}} = 4.99,$

$SD_{\text{looseness}} = 1.10$ vs. $M_{\text{tightness}} = 4.70$, $SD_{\text{tightness}} = 1.24$), $F(1, 201) = 0.00$, $p = .998$, $\eta_p^2 = .000$, 95% CI = [0.00, 0.00]; $F(1, 201) = 3.11$, $p = .079$, $\eta_p^2 = .015$, 95% CI = [- 0.03, 0.62], respectively.

A mixed-model ANOVA with target (same-sex leader vs. same-sex peers) as a within-subjects factor and condition (tightness vs. looseness) as a between-subjects factor revealed a significant interaction between target and condition (male targets: $F(1, 201) = 11.54$, $p = .001$, $\eta_p^2 = .054$; female targets: $F(1, 201) = 13.57$, $p < .001$, $\eta_p^2 = .063$). Although cultural tightness increased participants' preference for a muscular leader as mentioned above, stronger preferences for a muscular body in leaders did not extend to the body preference for average others: male average others ($M_{\text{looseness}} = 2.56$, $SD_{\text{looseness}} = 1.55$ vs. $M_{\text{tightness}} = 2.81$, $SD_{\text{tightness}} = 1.92$): $F(1, 201) = 1.01$, $p = .317$, $\eta_p^2 = .005$, 95% CI = [- 0.24, 0.73]; female average others ($M_{\text{looseness}} = 2.30$, $SD_{\text{looseness}} = 1.43$ vs. $M_{\text{tightness}} = 2.57$, $SD_{\text{tightness}} = 1.63$): $F(1, 201) = 1.61$, $p = .205$, $\eta_p^2 = .008$, 95% CI = [- 0.15, 0.70].

In addition, results showed that participants in the tightness condition ($M = 3.31$, $SD = 1.36$), compared to the looseness condition ($M = 2.56$, $SD = 1.17$), reported a higher level of preference for a dominant leader, $F(1, 201) = 18.01$, $p < .001$, $\eta_p^2 = .082$, 95% CI = [0.40, 1.11]. In contrast, no significant difference was observed in the preference for a prestigious leader, $F(1, 201) = 0.76$, $p = .385$, $\eta_p^2 = .004$, 95% CI = [- 0.14, 0.37].

Parallel mediation models (bootstrapping with 5000 resamples; Figures 5A and 5B) showed that the preference for body muscle in leaders was significantly explained by dominance derived from cultural tightness (male leader: $a*b = 0.06$, $SE = 0.03$, 95% CI = [0.02, 0.12]; female leader: $a*b = 0.07$, $SE = 0.025$, 95% CI = [0.02, 0.12]). In contrast, prestige was not a significant mediator in either model (male leader: $a*b = -0.01$, $SE = 0.01$, 95% CI = [- 0.03, 0.01]; female leader: $a*b = -0.01$, $SE = 0.01$, 95% CI = [- 0.02, 0.01]; see Supplementary Materials for full details).

Figure 5A. Mediation Model for the Effect of Cultural Tightness on the Preference for a Muscular Male Leader via the Preference for a Dominant (Prestigious) Leader, with b and p Values after Controlling for the Mediator Showing between Parentheses, Study 4

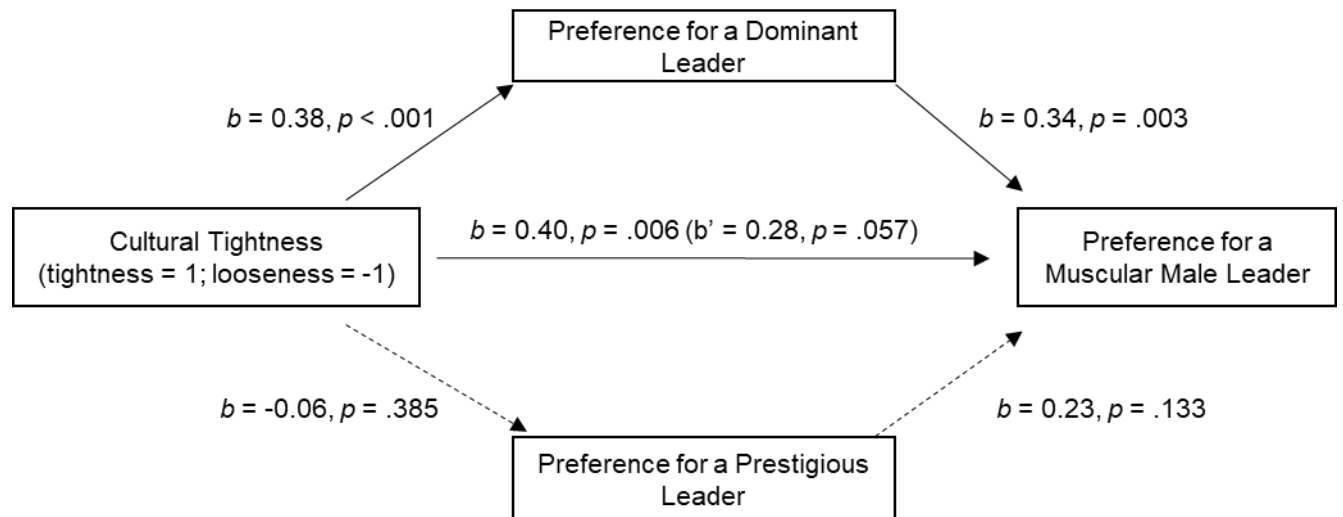
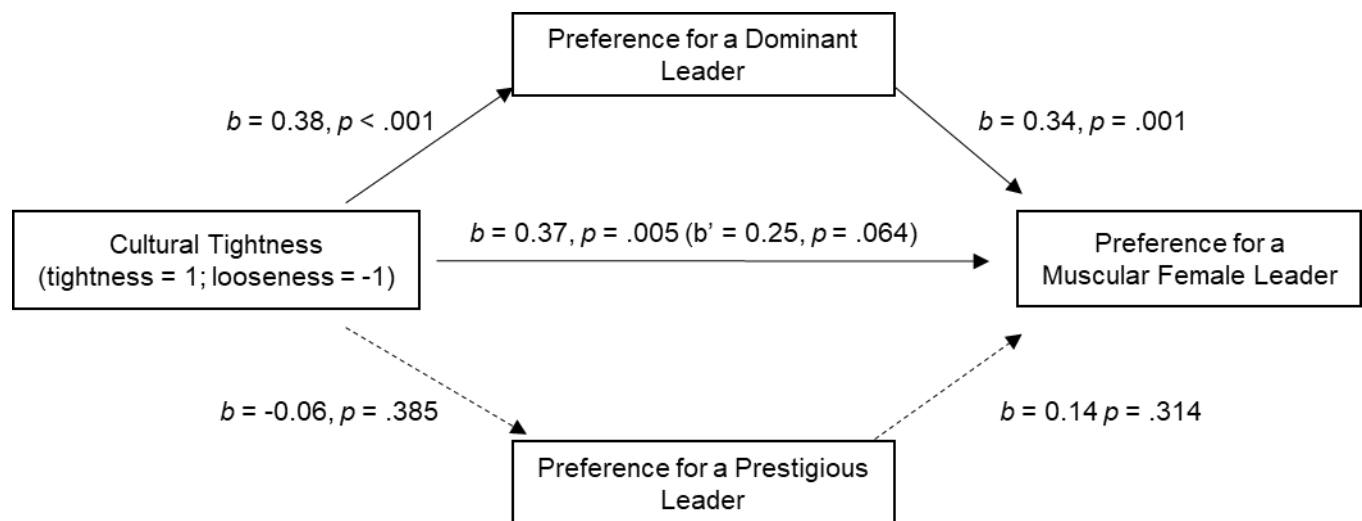


Figure 5B. Mediation Model for the Effect of Cultural Tightness on the Preference for a Muscular Female Leader via the Preference for a Dominant (Prestigious) Leader, with b and p Values after Controlling for the Mediator Showing between Parentheses, Study 4



Study 5A

The aims of Studies 5A and 5B were threefold. First, we aimed to replicate the findings of Study 4 by using a different manipulation method. Second, we aimed to test the full sequential mediation model (i.e., the effect of cultural tightness on the preference for

leaders' muscularity via authoritarianism and desiring dominant leadership). Third, we wanted to examine the prevalence of the hypothesized model by recruiting participants from the United States (Study 5A) and China (Study 5B).

Method

Participants

We recruited 410 American participants from Cloud Research. Eight participants failed attention check questions and this left a total of 402 participants (218 women, $M = 42.58$, $SD = 12.22$; 79% Caucasian American, 10% African American, 6% African American, 3% Latin American, 2% others) in the final analysis. We randomly assigned participants to either a tightness or a looseness condition, resulting in approximately 200 participants in each condition.

Procedure and Measures

To manipulate cultural tightness, we used the same paradigm as Study 3A (Jackson et al., 2021).

Next, participants completed a 10-item version of the classical RWA scale (Altemeyer, 1996, 2022), the most widely used measurement of authoritarianism (Conway et al., 2018). Examples were: "It is always better to trust the judgment of the proper authorities in government and religion than to listen to the noisy rabble-rousers in our society who are trying to create doubt in people's minds;" and "Our country will be destroyed someday if we do not smash the perversions eating away at our moral fiber and traditional beliefs." Participants were asked to respond to each statement on a 9-point Likert scale (1= strongly disagree, 9 = strongly agree). An overall score was calculated by averaging the scores across all items, with higher scores corresponding to higher levels of RWA ($\alpha = .93$).

Then, we measured people's preference for a dominant and a prestigious leader, using the adapted Dominance-Prestige Scale (Cheng et al., 2010; "I would like my leader to control

others rather than permit others to control him/her (dominance).” “I would like members of my peer group to respect and admire my leader (prestige).”) The overall dominance and prestige scores were calculated by averaging the corresponding items, with higher scores corresponding to higher levels on that dimension (dominance: $\alpha = .94$; prestige: $\alpha = .84$).

Next, using the same scales as in Studies 2-4, participants indicated their preference for leaders' body size.

Finally, participants reported their demographic information (i.e., gender, age, and ethnicity) before they were thanked and debriefed.

Results and Discussion

A mixed-model ANOVA with type (muscularity vs. fat) as a within-subjects factor and condition (tightness vs. looseness) as a between-subjects factor revealed a significant interaction between type and condition for both male and female leaders, $F(1, 400) = 8.97, p = .003, \eta_p^2 = .022$; $F(1, 400) = 10.49, p = .001, \eta_p^2 = .026$, respectively. Further analysis showed that participants in the tightness condition ($M_{\text{male_leader}} = 3.39, SD_{\text{male_leader}} = 1.98$; $M_{\text{female_leader}} = 3.03, SD_{\text{female_leader}} = 1.86$), compared to the looseness condition ($M_{\text{male_leader}} = 2.74, SD_{\text{male_leader}} = 1.68$; $M_{\text{female_leader}} = 2.40, SD_{\text{female_leader}} = 1.53$), preferred a more muscular body shape for both their male and female leaders $F(1, 400) = 12.29, p = .001, \eta_p^2 = .030$, 95% CI = [0.28, 1.00]; $F(1, 400) = 13.95, p < .001, \eta_p^2 = .034$, 95% CI = [0.30, 0.97], respectively (See Figure 4). Consistent with prior findings, cultural tightness did not significantly affect participants' preference for male ($M_{\text{looseness}} = 4.66, SD_{\text{looseness}} = 1.13$ vs. $M_{\text{tightness}} = 4.60, SD_{\text{tightness}} = 1.20$) or female ($M_{\text{looseness}} = 5.00, SD_{\text{looseness}} = 0.95$ vs. $M_{\text{tightness}} = 4.98, SD_{\text{tightness}} = 0.99$) leaders' body fat, $F(1, 400) = 0.30, p = .586, \eta_p^2 = .001$, 95% CI = [-0.17, 0.29]; $F(1, 400) = 0.07, p = .796, \eta_p^2 = .000$, 95% CI = [-0.17, 0.22].

In addition, results showed that participants in the tightness condition ($M_{\text{RWA}} = 4.36, SD_{\text{RWA}} = 1.98$; $M_{\text{dominance}} = 2.94, SD_{\text{dominance}} = 1.29$), compared to the looseness condition

($M_{RWA} = 3.67$, $SD_{RWA} = 2.06$; $M_{dominance} = 2.28$, $SD_{dominance} = 1.12$), reported higher levels of RWA and dominant leadership preference, $F(1, 400) = 11.82$, $p = .001$, $\eta_p^2 = .029$, 95% CI = [0.30, 1.09]; $F(1, 400) = 29.37$, $p < .001$, $\eta_p^2 = .068$, 95% CI = [0.42, 0.89], respectively. In contrast, no significant difference was observed in the preference for a prestigious leader, $F(1, 400) = 0.54$, $p = .461$, $\eta_p^2 = .001$, 95% CI = [-0.19, 0.09].

To further test the underlying mechanisms for the relationship between cultural tightness and the preference for a leader's muscularity, we conducted sequential mediation analyses (bootstrapping with 5000 resamples). Results showed that RWA and the desire to have a dominant leader could account for the link between cultural tightness and the preference for a female leader's muscularity, $a*b = 0.02$, $SE = 0.01$, 95% CI = [0.004, 0.041], as well as the link between cultural tightness and the preference for a male leader's muscularity, $a*b = 0.01$, $SE = 0.01$, 95% CI = [0.003, 0.023]. Please see Figures 6A and 6B. In contrast, the model was not significant if dominance was replaced with prestige, female leader: $a*b = 0.00$, $SE = 0.00$, 95% CI = [0.000, 0.007]; male leader: $a*b = 0.00$, $SE = 0.01$, 95% CI = [0.000, 0.005] (Figures 6A and 6B).

Figure 6A. *Sequential Mediation Model for the Effect of Cultural Tightness on the Preference for a Muscular Female Leader via Authoritarianism and the Preference for a Dominant (Prestigious) Leader, Study 5A*

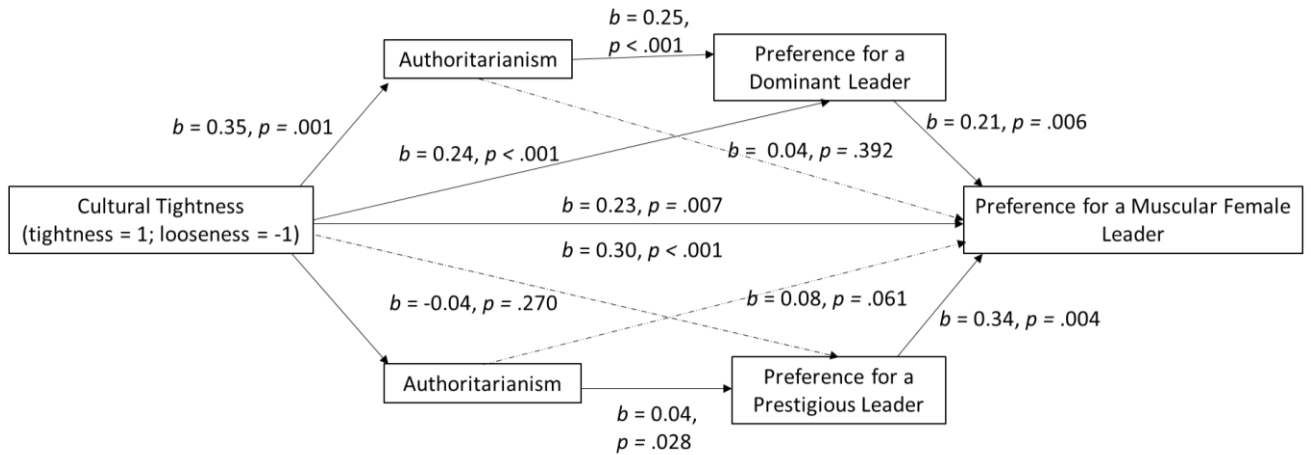
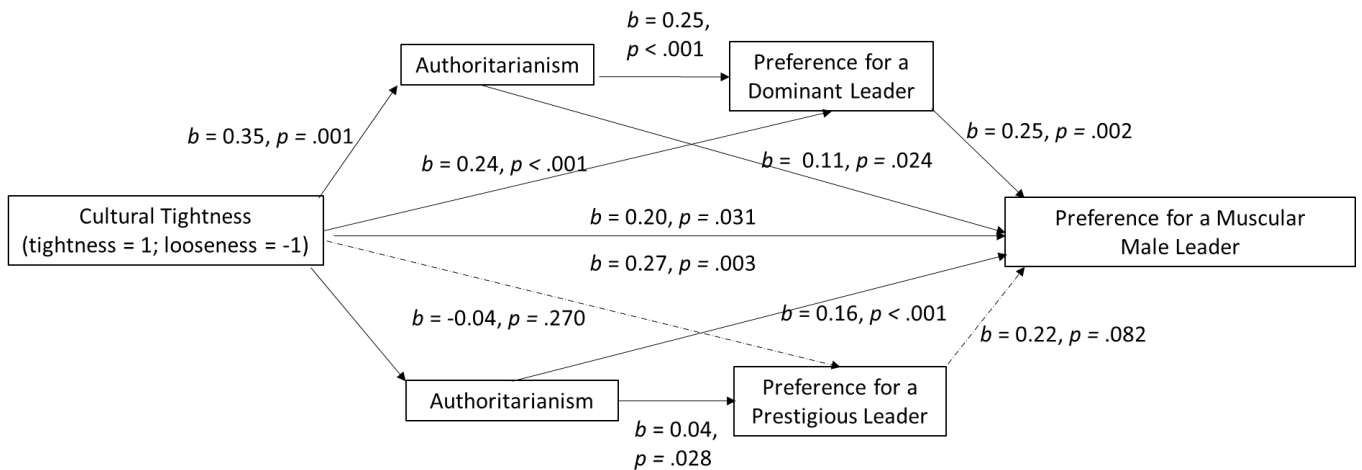


Figure 6B. *Sequential Mediation Model for the Effect of Cultural Tightness on the Preference for a Muscular Male Leader via Authoritarianism and the Preference for a Dominant (Prestigious) Leader, Study 5A*



Study 5B

Method

Participants

We recruited 410 Chinese participants via Credamo (an online platform for participant recruitment in China). Nine participants failed attention check questions and this left a total of 401 participants (221 women, $M = 29.93$, $SD = 7.82$) in the final analysis. Participants were randomly assigned to either a tightness or a looseness condition, resulting in approximately 200 participants in each condition.

Procedure and Measures

The study was conducted in Chinese. To manipulate cultural tightness, we adopted an adjusted paradigm of Studies 3A, 3B and 5A. Instead of mentioning a particular country, participants read a short paragraph attributing the success of a society to its strong foundation of law and order (tightness condition) or freedom and openness (looseness condition). Similarly, to increase the power of the manipulation, we required participants in the tightness condition (loose condition) to personally endorse up to three elements that could “preserve law and order” (“preserve freedom and openness”) in a society. Please see a pilot study that validated this method in Supplementary Materials.

Other measures were identical to Study 5A. The order of assessing RWA and the preference for a dominant and a prestigious leader was counterbalanced across participants.

Finally, participants reported their demographic information (i.e., gender and age) before they were thanked and debriefed.

Results and Discussion

A mixed-model ANOVA with type (muscularity vs. fat) as a within-subjects factor and condition (tightness vs. looseness) as a between-subjects factor revealed a significant interaction between type and condition for both male and female leaders, $F(1, 399) = 10.20$, $p = .002$, $\eta_p^2 = .025$; $F(1, 399) = 28.37$, $p < .001$, $\eta_p^2 = .066$, respectively. Further analysis showed that participants in the tightness condition ($M_{\text{male_leader}} = 4.23$, $SD_{\text{male_leader}} = 1.90$; $M_{\text{female_leader}} = 3.73$, $SD_{\text{female_leader}} = 2.04$) compared to the looseness condition ($M_{\text{male_leader}} =$

3.50, $SD_{\text{male_leader}} = 1.83$; $M_{\text{female_leader}} = 2.82$, $SD_{\text{female_leader}} = 1.79$) preferred a more muscular body shape for both male and female leaders, $F(1, 399) = 15.34$, $p < .001$, $\eta_p^2 = .037$, 95% CI = [0.36, 1.10]; $F(1, 399) = 22.66$, $p < .001$, $\eta_p^2 = .054$, 95% CI = [0.54, 1.29], respectively (See Figure 4). Consistent with prior findings, cultural tightness did not significantly affect participants' preference for a male leader's body fat ($M_{\text{looseness}} = 4.57$, $SD_{\text{looseness}} = 1.24$ vs. $M_{\text{tightness}} = 4.50$, $SD_{\text{tightness}} = 1.26$), $F(1, 399) = 0.29$, $p = .589$, $\eta_p^2 = .001$, 95% CI = [-0.18, 0.31]. In contrast, cultural tightness reduced participants' tolerance for body fat when it came to the preferred female leader's body ($M_{\text{tightness}} = 4.65$, $SD_{\text{tightness}} = 0.88$; $M_{\text{looseness}} = 4.91$, $SD_{\text{looseness}} = 1.07$), $F(1, 399) = 6.98$, $p = .009$, $\eta_p^2 = .017$, 95% CI = [0.07, 0.45].

In addition, results showed that participants in the tightness condition ($M_{\text{RWA}} = 5.51$, $SD_{\text{RWA}} = 1.14$; $M_{\text{dominance}} = 3.51$, $SD_{\text{dominance}} = 1.09$), compared to the looseness condition ($M_{\text{RWA}} = 3.46$, $SD_{\text{RWA}} = 1.02$; $M_{\text{dominance}} = 2.41$, $SD_{\text{dominance}} = 0.72$), reported higher levels of RWA and dominant leadership preference, $F(1, 399) = 359.06$, $p < .001$, $\eta_p^2 = .474$, 95% CI = [1.84, 2.27]; $F(1, 399) = 140.55$, $p < .001$, $\eta_p^2 = .260$, 95% CI = [0.92, 1.28], respectively. In contrast, no significant difference was observed in the preferences for a prestigious leader, $F(1, 399) = 0.51$, $p = .474$, $\eta_p^2 = .001$, 95% CI = [-0.12, 0.06].

Further sequential mediation analyses (bootstrapping with 5000 resamples) showed that RWA and then desiring to have a dominant leader could account for the link between cultural tightness and the preference for a female leader's muscularity ($a*b = 0.13$, $SE = 0.06$, 95% CI = [0.03, 0.25]) as well as the link between cultural tightness and the preference for a male leader's muscularity ($a*b = 0.17$, $SE = 0.06$, 95% CI = [0.06, 0.30]). Please see Figures 7A and 7B. In contrast, the model was not significant if dominance was replaced with prestige (female leader: $a*b = 0.00$, $SE = 0.01$, 95% CI = [-0.01, 0.01]; male leader: $a*b = 0.00$, $SE = 0.01$, 95% CI = [-0.01, 0.01]).

Figure 7A. *Sequential Mediation Model for the Effect of Cultural Tightness on the Preference for a Muscular Female Leader via Authoritarianism and the Preference for a Dominant (Prestigious) Leader, Study 5B*

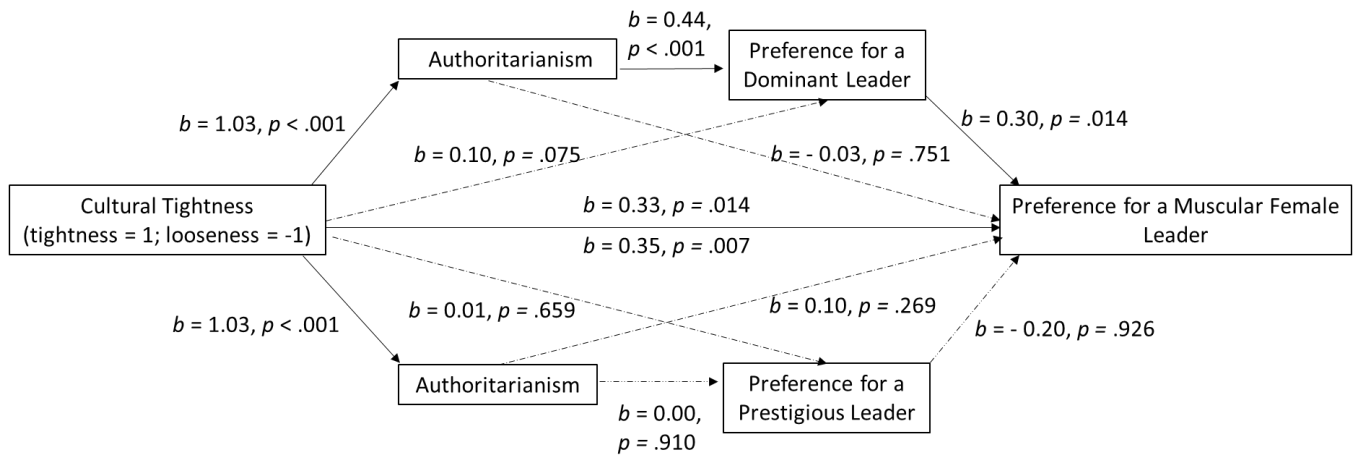
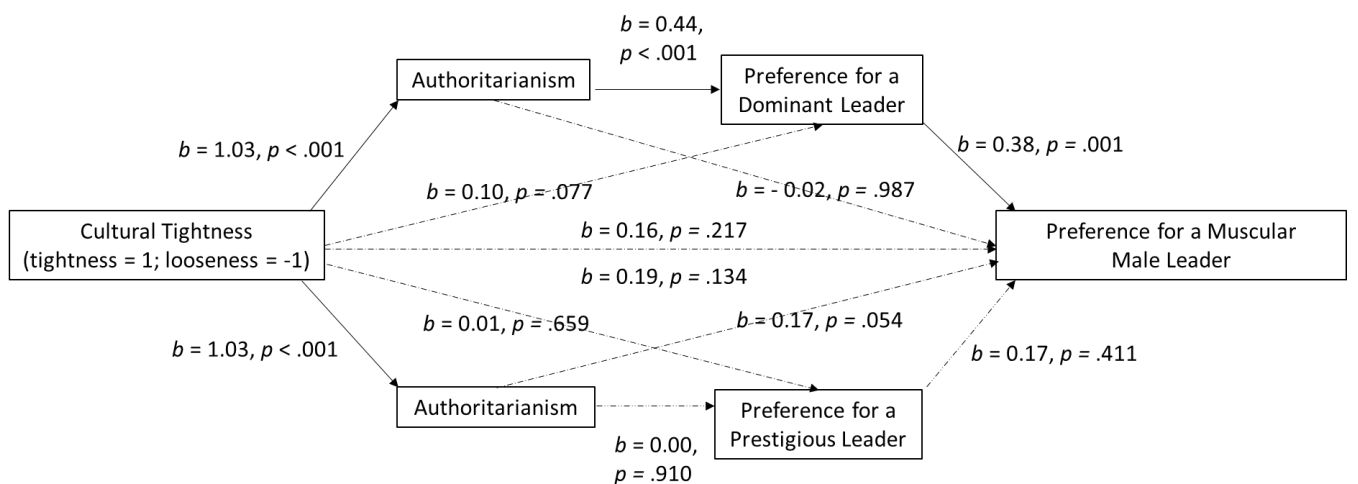


Figure 7B. *Sequential Mediation Model for the Effect of Cultural Tightness on the Preference for a Muscular Male Leader via Authoritarianism and the Preference for a Dominant (Prestigious) Leader, Study 5B*



General Discussion

In this research, we tested and supported the hypothesis that cultural tightness triggers the preference for a muscular leader, an embodiment of dominant leadership, among followers. In addition, this effect was partially accounted for by authoritarianism.

Based on estimates of the muscularity of governors of 50 U.S. states, Study 1 found a significant association between cultural tightness and muscularity. As such, governors selected in tight states (compared to loose ones) possessed a more muscular body. Importantly, this association remained significant after controlling for various cultural, ecological, and socio-demographic factors. Study 2 further showed a causal relationship, such that temporarily situating participants in a tight (versus loose) culture made them select a leader higher on muscularity. Studies 3A and 3B replicated the findings of Study 2 by using a different cultural tightness manipulation that temporarily shifted people's support for tightness. These effects were further replicated in Study 4. More importantly, this study demonstrated that the effect of culture on body preferences was driven by a preference for a dominant leadership in tight cultures. Studies 5A and 5B replicated the findings of Study 4 and further showed a full sequential mediation model, such that the effect of cultural tightness on the preference for leaders' muscularity was through authoritarianism and then the preference for dominant leadership. In other words, people in tight cultures, compared to loose ones, were more likely to conform with leaders. This further made followers prefer dominant and physically strong (i.e., muscular) leaders.

Importantly, the effects obtained occurred for both male and female leaders (Studies 2-5B) and were obtained among samples from the United States (Studies 1, 2, 3A, 4, and 5A), the United Kingdom (Study 3B), and China (Study 5B), which differ in ethnicities, cultures, and social ideologies. It is worth pointing out that the present research identified boundary conditions and ruled out a number of potential confounding variables. Cultural

tightness affected only the preference for muscularity and not body fat in leaders (Studies 2-5B). This suggests that it was not body size per se but rather muscularity, and presumably related strength, that was being solicited from leaders in tight cultures. Furthermore, the effect of tightness on the preference for muscularity was unique to leaders and was not generalized to the bodies of other people in the community (Studies 3A-4). Finally, cultural tightness increased the preference for dominant leaders and did not affect the desired level of prestige and reputation of leaders (Studies 4-5B).

Theoretical Contributions

This research has several theoretical contributions. First, it extends the existing findings on cultural tightness. Previous studies have shown that intrapersonally, individuals living in tight cultures obey strict social norms and avoid harsh punishments, as reflected by high self-regulation, self-monitoring, and even a more sensitive nervous system for detection of norm violations (Gelfand et al., 2011; Mu et al., 2015). However, in terms of structure, the effective implementation of any regulations and sanctions must be implemented in a system of power hierarchy in which leaders can influence group dynamics effectively (Ronay et al., 2012). Some preliminary correlational evidence has shown that cultural tightness is positively related to the endorsement of autonomous leadership (i.e., leaders with high confidence in their own abilities, Aktas et al., 2016). Our research goes one step further by showing that cultural tightness increases followers' support for dominant (but not prestigious) leadership that relies on controlling and intimidation, which further translates into a preference for leaders with a muscular body, an embodiment of dominant leadership.

In addition, prior work showed that dominant (vs. prestigious) leaders are better supported by the members of the groups encountering specific intergroup or intragroup conflicts (e.g., Bøggild & Laustsen, 2016; Re et al., 2013). However, few studies so far have systematically examined the influence of cultural tightness on leadership preferences.

Consistent with prior evidence, a tight culture is often formed to cope with historical and ecological threats, which can include intergroup or intragroup conflicts, population density, natural disasters, and resource scarcity (Gelfand et al., 2011; Harrington & Gelfand, 2014). Nevertheless, it is worth noting that an existing culture could continue to maintain, function, and exert its psychological consequences, even though the evolved origins of the culture have diminished or vanished for a long time (e.g., Obschonka et al., 2018). For example, Chinese people living in the historical rice (versus wheat) regions show more collectivistic cognitions and behaviors, even if they are no longer farmers (Talhelm et al., 2014). More relevantly, some countries with a tight culture nowadays, like Norway and Malaysia, no longer constantly face threats, such as disease prevalence, natural disasters, population density, or group conflicts (Gelfand et al., 2011). In other words, culture can be the outcome of historical events but can exist relatively independently of those factors. Therefore, people living in tight cultures could favor muscular leaders despite the absence of any current intergroup or intragroup conflicts or crises. This is also supported by the results of Study 1, such that the association between cultural tightness and leaders' muscularity remained significant after controlling for various ecological factors, such as risks of pathogens and disease, as well as cumulative ecological stress.

The effect of cultural tightness on leadership preference occurs because followers are more likely to conform to leaders unconditionally in a tight culture, as captured by authoritarianism. As such, we showed that authoritarianism could act as a belief, being (temporarily) heightened by situating followers in a tight culture. Therefore, our findings also extend early arguments that people's obedience to dominant leaders can be due to their authoritarian personality (e.g., Laustsen, 2017). In other words, cultural tightness, an external social structure emphasizing norms and punishments, can foster authoritarianism, an

individual-level belief entailing strict conforming to authority figures. Such individual-level authoritarianism further contributes to the preference for muscular leaders.

Crucially, prior studies indicate that people utilize several physical cues to evaluate the dominance of potential leaders, including facial dominance (e.g., Wang et al., 2018), facial muscularity (Alrajih & Ward, 2014), and low-pitched voices (Laustsen et al., 2015). To the best of our knowledge, no studies so far have systematically examined whether people would use body muscularity, another physical marker of dominance common across different social species, to evaluate leadership potential. In our research, we ascertained that individuals utilize body muscularity as a physical cue of dominant leadership to evaluate and select potential leaders. This occurs despite the fact that no scientific evidence suggests that muscularity could predict leadership capacity or competence.

Practical Implications

The present study has practical implications for understanding democracy in contemporary societies. A country's baseline level of cultural tightness can impact its democratization. Followers in a tight culture are more likely to conform to and favor dominant and muscular leaders. This is alarming since dominant people are often narcissistic, exploitative, and guided by an ambiguous moral compass (e.g., Bøggild & Laustsen, 2016), and muscularity is not an accurate index for competent and efficient leadership. Conforming to dominant leaders can reinforce rules and regulations that may not necessarily lead to the optimal functioning of a society, let alone democracy. The impact of culture on followers' leadership preference could even continue to exist when (temporary) changes in culture are introduced. For example, in Egypt (a country high in cultural tightness), people voted overwhelmingly for Abdel Fattah el-Sisi, a former general and fitness enthusiast, in the 2014 and 2018 presidential elections, choosing to be led by a dominant and muscular leader. Following his re-election and the approval of a set of constitutional amendments that gave

him more control over the judiciary and Parliament, Abdel Fattah el-Sisi took further steps to consolidate his power (Bloomberg, 2018; The New York Times, 2019). Notably, this occurred just a few years after the Arab Spring, a series of pro-democracy protests and uprisings. The link between cultural tightness and the preference for a dominant and muscular leader could “protect” this type of culture, creating a circle from tightness to conforming to dominant and muscular leaders and then back to an (even) tighter culture and impaired democracy.

Limitations and Future Avenues

Despite various contributions, there are limitations in our research, which pave avenues for future work. First, in Study 1, due to a lack of actual data for the body size of U.S. governors, we used their public photos and invited naïve participants to evaluate their physical muscularity after removing their identity. In other words, we used perceived muscularity as an index for actual muscularity in Study 1. Future research could try to obtain U.S. governors’ actual body size once such data is available. Furthermore, we did not include opponents’ body image to test whether the level of body muscularity of the elected governors was higher than that of their opponents. This is because the photographs of the runners-up were not up to the standards of experimental stimuli (e.g., characterized by low pixel quality, incomplete body part, not in frontal position), making such further analysis impossible. Therefore, although Study 1 supported our hypothesis using real-world leaders, the evidence should be considered preliminary.

To test the prevalence of our hypothesized effect, we employed samples from three different countries, including the United States (Studies 1-3A, 4, and 5A), the United Kingdom (Study 3B), and China (5B). Our results showed that temporarily situating participants in a tight culture (versus loose culture) made them prefer a more muscular leader, and this effect was evident across participants of different ethnicities and existed irrelevant of

the baseline level of cultural tightness in their country of residence. It is worth noting that we did not directly compare participants across these three countries due to the relatively small and uneven sample sizes as well as experimental manipulation induced (the United States: $N = 1009$; the United Kingdom: $N = 205$; China: $N = 401$). Future studies could consider replicating this effect by recruiting people from countries high (versus low) on cultural tightness (e.g., India versus Brazil) and directly comparing their preferences without introducing any experimental manipulations.

It is worth noting that there is increasing evidence of left-wing authoritarianism (LWA) and that LWA and RWA can share similar features, such as dogmatism, cognitive rigidity, and threat sensitivity (Conway et al., 2018; Costello et al., 2022). A recent study showed that ecological stress has similar effects on both LWA and RWA (Conway et al., 2023). Therefore, it would be intriguing for future research to test whether cultural tightness could result in the body preference of leaders via both RWA and LWA.

Finally, the current research showed that cultural tightness triggered the preference for a dominant and muscular leader. Future research could test whether a bidirectional effect exists such that leaders are perceived as (more) muscular when they are supported in tighter cultures. This is because people could associate leader effectiveness with physical dominance in tight cultures, and this mental association could further bias supporters' perception of leaders by believing them as more muscular than they actually are (Krumhuber et al., 2022; Wang et al., 2018).

Conclusion

To summarize, seven studies have shown that people in tight (versus loose) cultures prefer a target with a muscular body to leadership positions to a larger extent. This effect was (partially) mediated by authoritarianism and then a preference for dominant (but not prestigious) leadership. This research significantly contributes to multiple fields, including

cultural tightness, leadership style (e.g., dominance-prestige), and body image (e.g., muscularity).

References

- Aktas, M., Gelfand, M. J., & Hanges, P. J. (2016). Cultural tightness-looseness and perceptions of effective leadership. *Journal of Cross-Cultural Psychology, 47*(2), 294–309. <https://doi.org/10.1177/0022022115606802>
- Alrajih, S., & Ward, J. (2014). Increased facial width-to-height ratio and perceived dominance in the faces of the UK's leading business leaders. *British Journal of Psychology, 105*(2), 153–161. <https://doi.org/10.1111/bjop.12035>
- Altemeyer, B. (1996). *The authoritarian specter*. Harvard University Press.
- Altemeyer, B. (2022, March 5). A shorter version of the RWA scale. *The Authoritarians*. <https://theauthoritarians.org/a-shorter-version-of-the-rwa-scale/>
- Arkenau, R., Vocks, S., Taube, C. O., Waldorf, M., & Hartmann, A. S. (2020). The body image matrix of thinness and muscularity-male bodies: Development and validation of a new figure rating scale for body image in men. *Journal of Clinical Psychology, 76*(7), 1283–1292. <https://doi.org/10.1002/jclp.22933>
- Barkan, R. (Ed.) (2020). *Strongman Gov. Andrew Cuomo gives up and whines again about Trump and the Feds*. <https://news.yahoo.com/strongman-gov-andrew-cuomo-gives-235318187.html>
- Blake, K. R., & Brooks, R. C. (2019). Status anxiety mediates the positive relationship between income inequality and sexualization. *PNAS Proceedings of the National Academy of Sciences of the United States of America, 116*(50), 25029–25033. <https://doi.org/10.1073/pnas.1909806116>
- Bloomberg (Ed.) (2018). *El-Sisi calls on Egyptians to lose weight*. <https://www.bloomberg.com/news/articles/2018-12-25/el-sissi-s-call-on-egyptians-to-lose-weight-creates-a-stir?leadSource=verify%20wall>

- Bøggild, T., & Laustsen, L. (2016). An intra-group perspective on leader preferences: Different risks of exploitation shape preferences for leader facial dominance. *The Leadership Quarterly*, 27(6), 820–837. <https://doi.org/10.1016/j.leaqua.2016.09.003>
- Carney, D. R., Hall, J. A., & LeBeau, L. S. (2005). Beliefs about the nonverbal expression of social power. *Journal of Nonverbal Behavior*, 29(2), 105–123. <https://doi.org/10.1007/s10919-005-2743-z>
- Carpenter, S. (2000). Effects of cultural tightness and collectivism on self-concept and causal attributions. *Cross-Cultural Research*, 34(1), 38–56. <https://doi.org/10.1177/106939710003400103>
- Carrier, D. R., & Morgan, M. H. (2015). Protective buttressing of the hominin face. *Biological Reviews of the Cambridge Philosophical Society*, 90(1), 330–346. <https://doi.org/10.1111/brv.12112>
- Chen, H., Wang, X. J., Zang, H. L., & Guinote, A. (2021). Being a tough person in a tight world: Cultural tightness leads to a desire for muscularity. *Journal of Experimental Social Psychology*, 96, Article 104183. <https://doi.org/10.1016/j.jesp.2021.104183>
- Cheng, J. T., Tracy, J. L., & Henrich, J. (2010). Pride, personality, and the evolutionary foundations of human social status. *Evolution and Human Behavior*, 31(5), 334–347. <https://doi.org/10.1016/j.evolhumbehav.2010.02.004>
- Conway, L. G. III, Bongard, K., Plaut, V., Gornick, L. J., Dodds, D. P., Giresi, T., Tweed, R. G., Repke, M. A., & Houck, S. C. (2017). Ecological origins of freedom: Pathogens, heat stress, and frontier topography predict more vertical but less horizontal governmental restriction. *Personality and Social Psychology Bulletin*, 43(10), 1378–1398. <https://doi.org/10.1177/0146167217713192>

- Conway, L. G. III, Houck, S. C., Gornick, L. J., & Repke, M. A. (2018). Finding the Loch Ness Monster: Left-wing authoritarianism in the United States. *Political Psychology*, 39(5), 1049–1067. <https://doi.org/10.1111/pops.12470>
- Conway, L. G. III, McFarland, J. D., Costello, T. H., & Lilienfeld, S. O. (2021). The curious case of left-wing authoritarianism: When authoritarian persons meet anti-authoritarian norms. *Journal of Theoretical Social Psychology*, 5(4), 423–442. <https://doi.org/10.1002/jts5.108>
- Conway, L. G. III, Sexton, S. M., & Tweed, R. G. (2006). Collectivism and governmentally initiated restrictions: A cross-sectional and longitudinal analysis across nations and within a nation. *Journal of Cross-Cultural Psychology*, 37(1), 20–41. <https://doi.org/10.1177/0022022105282293>
- Conway, L. G. III, Zubrod, A., Chan, L., McFarland, J. D., & van de Vliert, E. (2023). Is the myth of left-wing authoritarianism itself a myth? *Frontiers in Psychology*, 13, Article 1041391. <https://doi.org/10.3389/fpsyg.2022.1041391>
- Costello, T. H., Bowes, S. M., Stevens, S. T., Waldman, I. D., Tasimi, A., & Lilienfeld, S. O. (2022). Clarifying the structure and nature of left-wing authoritarianism. *Journal of Personality and Social Psychology*, 122(1), 135–170. <https://doi.org/10.1037/pspp0000341>
- Dijker, A. J. M., DeLuster, R., Peeters, N., & Vries, N. K. (2017). Seeing overweight adults as babies: Physical cues and implications for stigmatization. *British Journal of Psychology*, 108(4), 757–782. <https://doi.org/10.1111/bjop.12240>
- Duckitt, J. (1989). Authoritarianism and group identification: A new view of an old construct. *Political Psychology*, 10(1), 63–84. <https://doi.org/10.2307/3791588>

- Duckitt, J., Bizumic, B., Krauss, S. W., & Heled, E. (2010). A tripartite approach to Right-Wing Authoritarianism: The Authoritarianism-Conservatism-Traditionalism model. *Political Psychology, 31*(5), 685–715. <https://doi.org/10.1111/j.1467-9221.2010.00781.x>
- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*(2), 175–191. <https://doi.org/10.3758/bf03193146>
- Fincher, C. L., & Thornhill, R. (2012). Parasite-stress promotes in-group assortative sociality: The cases of strong family ties and heightened religiosity. *Behavioral and Brain Sciences, 35*(2), 61–79. <https://doi.org/10.1017/S0140525X11000021>
- Frederick, D. A., Buchanan, G. M., Sadehgi-Azar, L., Peplau, L. A., Haselton, M. G., Berezovskaya, A., & Lipinski, R. E. (2007). Desiring the muscular ideal: Men's body satisfaction in the United States, Ukraine, and Ghana. *Psychology of Men & Masculinity, 8*(2), 103–117. <https://doi.org/10.1037/1524-9220.8.2.103>
- Frederick, D. A., & Haselton, M. G. (2007). Why is muscularity sexy? Tests of the fitness indicator hypothesis. *Personality and Social Psychology Bulletin, 33*(8), 1167–1183. <https://doi.org/10.1177/0146167207303022>
- Garfield, Z. H., Hubbard, R. L., & Hagen, E. H. (2019). Evolutionary models of leadership: Tests and synthesis. *Human Nature, 30*(1), 23–58. <https://doi.org/10.1007/s12110-019-09338-4>
- Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. A., Lun, J., Lim, B. C., Duan, L., Almaliach, A., Ang, S., Arnadottir, J., Aycan, Z., Boehnke, K., Boski, P., Cabecinhas, R., Chan, D., Chhokar, J., D'Amato, A., Ferrer, M., Fischlmayr, I. C., . . . Yamaguchi, S. (2011). Differences between tight and loose cultures: A 33-nation study. *Science, 332*(6033), 1100–1104. <https://doi.org/10.1126/science.1197754>

- Gelfand, M. J., Nishii, L. H., & Raver, J. L. (2006). On the nature and importance of cultural tightness-looseness. *Journal of Applied Psychology, 91*(6), 1225–1244.
<https://doi.org/10.1037/0021-9010.91.6.1225>
- Hall, J. A., Coats, E. J., & LeBeau, L. S. (2005). Nonverbal behavior and the vertical dimension of social relations: A meta-analysis. *Psychological Bulletin, 131*(6), 898–924.
<https://doi.org/10.1037/0033-2909.131.6.898>
- Harrington, J. R., & Gelfand, M. J. (2014). Tightness-looseness across the 50 United States. *PNAS Proceedings of the National Academy of Sciences of the United States of America, 111*(22), 7990–7995. <https://doi.org/10.1073/pnas.1317937111>
- Haselhuhn, M. P., Wong, E. M., Ormiston, M. E., Inesi, M. E., & Galinsky, A. D. (2014). Negotiating face-to-face: Men's facial structure predicts negotiation performance. *The Leadership Quarterly, 25*(5), 835–845. <https://doi.org/10.1016/j.leaqua.2013.12.003>
- Herscovis, M. S., Neville, L., Reich, T. C., Christie, A. M., Cortina, L. M., & Shan, J. V. (2017). Witnessing wrongdoing: The effects of observer power on incivility intervention in the workplace. *Organizational Behavior and Human Decision Processes, 142*, 45–57.
<https://doi.org/10.1016/j.obhdp.2017.07.006>
- Jackson, J. C., Caluori, N., Abrams, S., Beckman, E., Gelfand, M., & Gray, K. (2021). Tight cultures and vengeful gods: How culture shapes religious belief. *Journal of Experimental Psychology: General, 150*(10), 2057–2077.
<https://doi.org/10.1037/xge0001033>
- Kakkar, H., & Sivanathan, N. (2017). When the appeal of a dominant leader is greater than a prestige leader. *PNAS Proceedings of the National Academy of Sciences of the United States of America, 114*(26), 6734–6739. <https://doi.org/10.1073/pnas.1617711114>

- Krumhuber, E. G., Wang, X., & Guinote, A. (2022). The powerful self: How social power and gender influence face perception. *Current Psychology*.
<https://doi.org/10.1007/s12144-022-02798-5>
- Kümmerli, R. (2011). A test of evolutionary policing theory with data from human societies. *PLoS ONE*, 6(9), Article e24350. <https://doi.org/10.1371/journal.pone.0024350>
- Laustsen, L. (2017). Choosing the right candidate: Observational and experimental evidence that conservatives and liberals prefer powerful and warm candidate personalities, respectively. *Political Behavior*, 39(4), 883–908. <https://doi.org/10.1007/s11109-016-9384-2>
- Laustsen, L. (2021). Candidate evaluations through the lens of adaptive followership psychology: How and why voters prefer leaders based on character traits. *Political Psychology*, 42(1), 109–148. <https://doi.org/10.1111/pops.12738>
- Laustsen, L., Petersen, M. B., & Klofstad, C. A. (2015). Vote choice, ideology, and social dominance orientation influence preferences for lower pitched voices in political candidates. *Evolutionary Psychology*, 13(3), 1–13.
<https://doi.org/10.1177/1474704915600576>
- Li, R., Gordon, S., & Gelfand, M. J. (2017). Tightness-looseness: A new framework to understand consumer behavior. *Journal of Consumer Psychology*, 27(3), 377–391.
<https://doi.org/10.1016/j.jcps.2017.04.001>
- Litman, L., Robinson, J., & Abberbock, T. (2017). TurkPrime.com: A versatile crowdsourcing data acquisition platform for the behavioral sciences. *Behavior Research Methods*, 49(2), 433–442. <https://doi.org/10.3758/s13428-016-0727-z>
- Lukaszewski, A. W., Simmons, Z. L., Anderson, C., & Roney, J. R. (2016). The role of physical formidability in human social status allocation. *Journal of Personality and Social Psychology*, 110(3), 385–406. <https://doi.org/10.1037/pspi0000042>

- Manson, J. H. (2020). Right-wing authoritarianism, left-wing authoritarianism, and pandemic-mitigation authoritarianism. *Personality and Individual Differences, 167*, Article 110251. <https://doi.org/10.1016/j.paid.2020.110251>
- Mazur, A., & Booth, A. (1998). Testosterone and dominance in men. *Behavioral and Brain Sciences, 21*(3), 353–397. <https://doi.org/10.1017/S0140525X98001228>
- Mu, Y., Kitayama, S., Han, S., & Gelfand, M. J. (2015). How culture gets embrained: Cultural differences in event-related potentials of social norm violations. *PNAS Proceedings of the National Academy of Sciences of the United States of America, 112*(50), 15348–15353. <https://doi.org/10.1073/pnas.1509839112>
- Munoz-Reyes, J. A., Polo, P., Rodríguez-Sickert, C., Pavez, P., Valenzuela, N., & Ramírez-Herrera, O. (2019). Muscularity and strength affect individual variation in self-perception of fighting ability in men. *Frontiers in Psychology, 10*, Article 18. <https://doi.org/10.3389/fpsyg.2019.00018>.
- Obschonka, M., Stuetzer, M., Rentfrow, P. J., Shaw-Taylor, L., Satchell, M., Silbereisen, R. K., Potter, J., & Gosling, S. D. (2018). In the shadow of coal: How large-scale industries contributed to present-day regional differences in personality and well-being. *Journal of Personality and Social Psychology, 115*(5), 903–927. <https://doi.org/10.1037/pspp0000175>
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879–891. <https://doi.org/10.3758/brm.40.3.879>.
- Puhl, R. M., & Heuer, C. A. (2009). The stigma of obesity: A review and update. *Obesity, 17*(5), 941–964. <https://doi.org/10.1038/oby.2008.636>

- Re, D. E., DeBruine, L. M., Jones, B. C., & Perrett, D. I. (2013). Facial cues to perceived height influence leadership choices in simulated war and peace contexts. *Evolutionary Psychology, 11*(1), 89–103. <https://doi.org/10.1177/147470491301100109>
- Ronay, R., Greenaway, K., Anicich, E. M., & Galinsky, A. D. (2012). The path to glory is paved with hierarchy: When hierarchical differentiation increases group effectiveness. *Psychological Science, 23*(6), 669–677. <https://doi.org/10.1177/0956797611433876>
- Shah, P. P., Peterson, R. S., Jones, S. L., & Ferguson, A. J. (2021). Things are not always what they seem: The origins and evolution of intragroup conflict. *Administrative Science Quarterly, 66*(2), 426–474. <https://doi.org/10.1177/0001839220965186>
- Stamkou, E., van Kleef, G. A., Homan, A. C., Gelfand, M. J., van de Vijver, F. J. R., van Egmond, M. C., Boer, D., Phiri, N., Ayub, N., Kinias, Z., Cantarero, K., Treister, D. E., Figueiredo, A., Hashimoto, H., Hofmann, E. B., Lima, R. P., & Lee, I-C. (2019). Cultural collectivism and tightness moderate responses to norm violators: Effects on power perception, moral emotions, and leader support. *Personality and Social Psychology Bulletin, 45*(6), 947–964. <https://doi.org/10.1177/0146167218802832>
- Stenner, K. (2005). *The authoritarian dynamic*. Cambridge University Press.
<https://doi.org/10.1017/CBO9780511614712>
- Talhelm, T., Zhang, X., Oishi, S., Shimin, C., Duan, D., Lan, X., & Kitayama, S. (2014). Large-scale psychological differences within China explained by rice versus wheat agriculture. *Science, 344*(6184), 603–608. <https://doi.org/10.1126/science.1246850>
- Texas Monthly (Ed.) (2021). *How Greg Abbott became the most powerful governor in Texas history*. <https://www.texasmonthly.com/news-politics/greg-abbott-seized-power/>
- The New Yorker (Ed.) (2022). *The political strategy of Ron DeSantis's "Don't Say Gay" bill*. <https://www.newyorker.com/news/the-political-scene/the-political-strategy-of-ron-desantiss-dont-say-gay-bill>

- The New York Times (Ed.) (2019). *Egypt approves new muscle for el-Sisi, its strongman leader*. <https://www.nytimes.com/2019/04/23/world/middleeast/sisi-egypt-referendum.html>
- van Vugt, M., & Spisak, B. R. (2008). Sex differences in the emergence of leadership during competitions within and between groups. *Psychological Science, 19*(9), 854–858. <https://doi.org/10.1111/j.1467-9280.2008.02168.x>
- van Vugt, M., Hogan, R., & Kaiser, R. B. (2008). Leadership, followership, and evolution: Some lessons from the past. *American Psychologist, 63*(3), 182–196. <https://doi.org/10.1037/0003-066X.63.3.182>
- Vandello, J. A., & Cohen, D. (1999). Patterns of individualism and collectivism across the United States. *Journal of Personality and Social Psychology, 77*(2), 279–292. <https://doi.org/10.1037/0022-3514.77.2.279>
- Wang, X., Chen, H., Chen, Z. & Yang, Y. (2021). Women’s intrasexual competition results in beautification. *Social Psychological and Personality Science, 12*(5), 648–657. <https://doi.org/10.1177/1948550620933403>
- Wang, X., Chen, Z., Krumhuber, E. G., & Chen, H. (2021). Money and flexible generosity. *The British Journal of Social Psychology, 60*(4), 1262–1278. <https://doi.org/10.1111/bjso.12450>
- Wang, X., Chen, H., Chen, Z., & Luo, S. (2022). An exchange orientation results in an instrumental approach in intimate relationships. *British Journal of Social Psychology, 61*(4), 1144–1159. <https://doi.org/10.1111/bjso.12530>
- Wang, X., Chen, H., Shi, J., & Chen, Z. (2023). Threatened humanity in a tight world: Cultural tightness results in self-objectification. *Group Processes & Intergroup Relations, 25*(8), 2003–2020. <https://doi.org/10.1177/13684302221097842>

Wang, X., Guinote, A., & Krumhuber, E. G. (2018). Dominance biases in the perception and memory for the faces of powerholders, with consequences for social inferences. *Journal of Experimental Social Psychology*, 78, 23–33.

<https://doi.org/10.1016/j.jesp.2018.05.003>