



Impact of State Tightness-Looseness on COVID-19 Infection Rates

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Introduction

- With an initial lack of a federal response to the COVID-19 pandemic, state governments led responses to this pandemic in the US.
- Tightness-looseness describes the difference across societies in adherence to rules and tolerance for deviance.
 - E.g. mask mandates, stay at home orders
- It has compared responses to legal measures and punishments across different states and, recently, cross-nation differences related to COVID cases and deaths (Harrington et al., 2014 ; Gelfand et al., 2021).
- *We investigate the effect of state tightness-looseness on outcomes related to COVID-19, focusing on infection rates.*

Hypothesis:

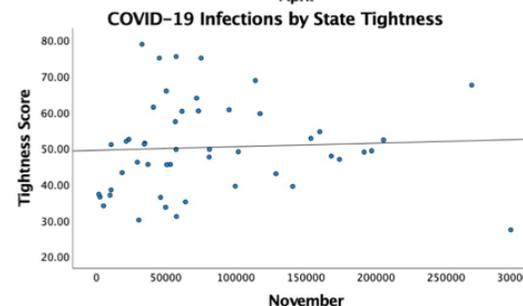
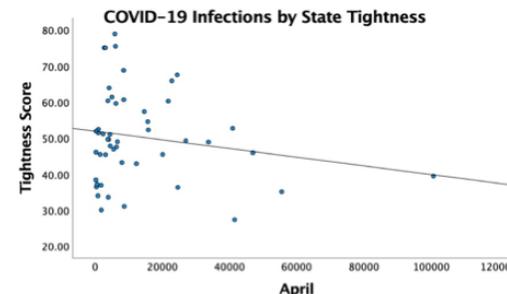
- Looser US states will show \uparrow COVID-19 infection rates than tighter US states.
- We focus on November and April 2020, peaks, predicting that tightness will affect rates later

Materials and Methods

- Collated state infection data from usafacts.org and archival state tightness scores (Harrington et al., 2014)
- Used April 2020 for an early peak and November 2020 as a later peak (pre-vaccines)
- Two regression models (one for each timepoint) were used to evaluate whether state tightness-looseness was associated with COVID-19 infections, controlling for:
 - State population
 - Political affiliation (% Republican voters)
 - Temperature (November only)
 - One outlier (> 3 SD) state removed from each analysis

Results

- Positive association between tightness-looseness score in November ($\beta = .21, p=.04$), but not for April ($\beta = -.01, p=.94$)
- Population had a positive association with infection rate
 - April ($\beta = .40, p=.003$)
 - November ($\beta = .93, p<.001$)
- For November, the average temperature was negatively associated with infection rate ($\beta = -.27, p=.005$)
- More stringent polices were related to lower infection rates ($\beta = -.16, p=.056$)



Conclusion

- Results were the opposite of predictions in that *tighter* states experienced higher infection rates than looser states.
- One potential explanation is that *state* tightness-looseness differs from the cultural orientation of *individuals* in that state to some extent.
- States with tighter rules may have more defiant citizens that commit actions that accelerate infection rates compared to looser states.
- Another potential explanation is that *shifts* in cultural tightness in response to the pandemic may be more sensitive predictors of threat responsiveness than state-wide tightness/looseness.
 - People in looser societies may have experienced a larger shift than individuals in tighter societies in response to threat.

References

1. Gelfand, M., Jackson, J., Pan, X., Nau, D., Pieper, D., Denison, E., Dagher, M., Lange, P., Chiu, C. Y., & Wang, M. (2021). The relationship between cultural tightness-looseness and COVID-19 cases and deaths: A global analysis. *The Lancet Planetary Health*, 5. [https://doi.org/10.1016/S2542-5196\(20\)30301-6](https://doi.org/10.1016/S2542-5196(20)30301-6)
2. Harrington, J. R., and M. J. Gelfand. "Tightness-Looseness across the 50 United States." *Proceedings of the National Academy of Sciences*, vol. 111, no. 22, 2014, pp. 7990-7995. <https://doi.org/10.1073/pnas.1317937111>.