The Need to Trust: How Features of the Forecasted Weather Increase Forecast Trust

Joy E. Losee; Susan Joslyn

UF UNIVERSITY of FLORIDA

Background

- Trust is an important part of hazard mitigation (e.g., Lin, Shaw, & Ho, 2008; McIvor, Paton, & Johnston, 2009; Njome, Suh, Chuyong, & de Wit, 2010)
- Specifics of the information and individual perceptions might influence trust. (Jost, Banaji, & Nosek, 2004)
  - **Severity:** For a severe (vs. non-severe) event, people tend to perceive greater risk and may correspond to a greater need to trust.
    - System justification posits that severe threats increase a need to trust (Jost, Banaji, & Nosek, 2004)
  - **Familiarity:** Greater familiarity with a weather pattern likely corresponds to a lower need for trust in information about that weather.
    - Greater personal experience has been linked to lower risk perception (Matayas et al., 2011)
  - **Consistency:** Inconsistencies in information can negatively influence how people use the information (e.g., Elder, Xirasagar & Piper), 2007).

Hypotheses

Greater trust for…

- high severity forecasts.
- unfamiliar weather patterns.
- consistent forecasts
- greater perceived severity and threat.

Method

Participants

107 University of Florida and 105 University of Washington undergraduate psychology students (Age_M = 19.11, SD = 2.65; 61.8 % female)

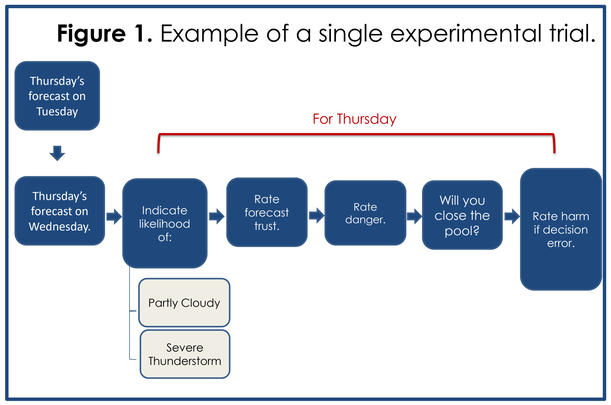
**Familiarity operationalized as the location (UF vs. UW) x weather type (snow vs. thunder) interaction—e.g., UW participants were in the *unfamiliar* condition when they completed the thunder task and *familiar* when they completed the snow task.

Design and Procedure

Participants were charged with two tasks:

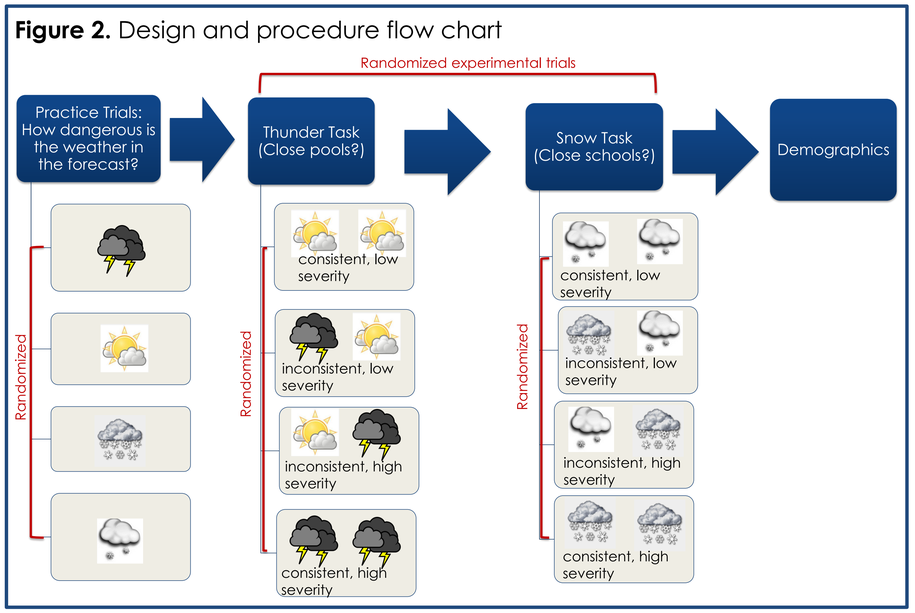
1. close schools in the snow task if they think weather will be dangerous
2. close pools in the thunder task if they think weather will be dangerous

Figure 1. Example of a single experimental trial.



All responses to continuous measures were from 0 to 100

Figure 2. Design and procedure flow chart



Results

Predicting trust:

6 nested mixed linear models (MLM; Hoffman & Rovine, 2007)

Increased trust predicted by:

Experimental Manipulation (Model 2)

- High severity forecasts
  - (b = -0.02 to -0.05, se = .01 to .02)
- More consistent forecasts
  - (b = -0.07 to -0.08, se = .01 to .02)
- Winter forecasts

Perceptual variables (Model 3 – 5):

- Individual level perceived likelihood of high severity
  - (b = 0.19 to 0.30, se = .05 to .06)
- Trial-by-trial level perceived likelihood of high severity
  - (b = 0.10 to 0.12, se = .03 to .04)
- Trial-by-trial level perceived likelihood of low severity
  - (b = 0.11, se = .03)
- Individual level perceived danger
  - (b = 0.40 to .51, se = .15 to .19)
- Trial-by-trial level expected harm
  - (b = .09, se = .03)

Individual differences (Model 6)

- Identifying as male
  - (b = -.16, se = .05)
- Familiarity (weather pattern x location; b = .04, se = .02)
  - Floridians trusted snow (*unfamiliar*) forecasts more than thunder (*familiar*)forecasts.
  - Washingtonians trusted the two forecast about equally, however, they trusted the thunder (*unfamiliar*) forecasts more than Floridians did.

Closure decisions:

We used Generalized Estimating Equations (GEE) to analyze closure decisions.

Participants were **more likely to close** when…

- forecasted severity was high
  - (b = -5.12, se = .28)
- forecasts were consistent
  - (b = 1.06, se = .25)
- participants generally trusted the forecasts more
  - (b = -0.31, se = .17)

Conclusions

Hypothesis Support

- **Trust:** Greater trust for high severity forecasts, with higher risk and threat perception, for consistent forecasts and for unfamiliar weather.
- **Closure decisions:** Forecast severity, consistency and trust also predicted a greater likelihood to close the schools or pools.

Conclusion

- People trust forecasts when they need to—when the weather is severe, they see it as severe, and when the threat is unfamiliar.

Limitations and Future Directions

- Participants were students—not used to making school or pool closure decisions.
- Overall reports of familiarity were higher for thunderstorms than "several inches of snow."
- In the future, we can work to improve the "several inches of snow" forecast to make it more

References

- Elder, K., Xirasagar, S., & Piper, C. (2007). African Americans' decisions not to evacuate new orleans before hurricane katrina: A qualitative study. *American Journal of Public Health, 97*, 124-129
- Hoffman, L. & Rovine, M. J., 2007: Multilevel models for the experimental psychologist: Foundations and illustrative examples. *Behavior Research Methods, 39*, 101-117. doi: 10.3758/s13428-014-0474-y
- Jost, J. T., Banaji, M. R., & Nosek, B. A., 2004: A decade of system justification theory: Accumulated evidence of conscious and unconscious bolstering of the status quo. *Political Psychology, 25*, 881-919. doi: 10.1111/j.1467-9221.2004.00402.x
- Lin, S., Shaw, D., & Ho, M-C. (2008). Why are flood and landslide victims less willing to take mitigation measures than the public? *Natural Hazards, 44*, 305-314. doi: 10.1007/s11069-007-9136-z
- McIvor, D., Paton, D., & Johnston, D., 2009: Modelling community preparation for natural hazards: Understanding hazard cognitions. *Journal of Pacific Rim Psychology, 3*, 39-46. doi: /10.1375/prp.3.2.39
- Njome, M. S., Suh, C. E., Chuyong, G., & de Wit, M. J., 2010. Volcanic risk perception in rural communities along the slopes of mount Cameroon, West-Central Africa. Journal of African Earth Science, 58, 608-622.
- Matayas, C. J., Srinivasan, S., Cahyanto, I., & Villegas, J., 2011: Risk perception and evacuation decisions of Florida tourists under hurricane threats: A stated preference analysis. Natural Hazards, 59, 871-890. doi: 10.1007/s11069-011-9801-0