



# Impact of Induced Stress on Susceptibility to Framing Effect by Domain

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## Introduction

- Being able to **identify influences on decision-making** is important to ensuring that high-risk decisions are not unknowingly influenced by outside factors.
- Framing effect<sup>3</sup>**: Decisions involving gains tend to be risk averse and decisions involving loss tend to be risk taking.
  - Demonstrated in both **medical** situations (life or death decisions) and in **financial** situations (gaining or losing money).
  - Emotion arousal enhances the framing effect in the Medical domain, though domain differences were not explored<sup>1</sup>.
- Prior research finds stress to generally increase risk aversion, but there is conflicting evidence as to whether stress impacts the magnitude of the framing effect<sup>5,6,7</sup>. One possibility is that the domain matters - that is the question addressed in this research.

→ Can give insight how the framing effect can impact decision-making in high-stakes high-stress scenarios.

## Research Question

**Does induced stress have a differential impact on the framing effect in medical versus financial situations?**

Predictions:

Induced stress → ↑ susceptibility to framing effect (research has shown trait stress to have this effect<sup>2</sup>.)  
**Stronger** in the medical domain than financial domain.

## Methods

N=167 Boston College undergraduate students (female = 116, age M=19y)  
81 in Stress Condition  
86 in Control Condition

**PROCEDURE**  
(Heart Rate Measured After Each Task)

- Stress induction (or Control task)
  - Modified Trier Social Stress Test (counting)
- 8 Framing Effect Vignettes
  - Mixed domain, all same frame
- Stress induction repeated (or no stress control)
- 8 Framing Effect Vignettes
  - Mixed domain, other frame

## Framing Vignettes: Examples

**Medical Domain:**

There are 15 people in the Emergency Room who were involved in an explosion and need emergency surgery. There are two different surgery treatments that can be used, but all 15 of the patients will get the same surgery. You are the surgeon in charge of making the decision. Which surgery will you choose?

Loss Frame:

If Surgery A is used, exactly 10 of the people will die  
If Surgery B is used, there is a 33% chance that none of the people will die and a 67% chance that all of the people will die.

**Financial Domain:**

Imagine that you are playing basketball with your friend, and you bet \$15 that you can make a basket from half-court. You miss the shot. Your friend offers you two choices to get some of your money back. Which choice do you pick?

Gain Frame:

If you pick Choice A, you will save exactly \$5 of the money you bet.  
If you pick Choice B, your friend will do a random drawing where you have a 67% chance of saving all of the money you bet, and a 33% chance of saving none of the money you bet.

## Results – By Condition

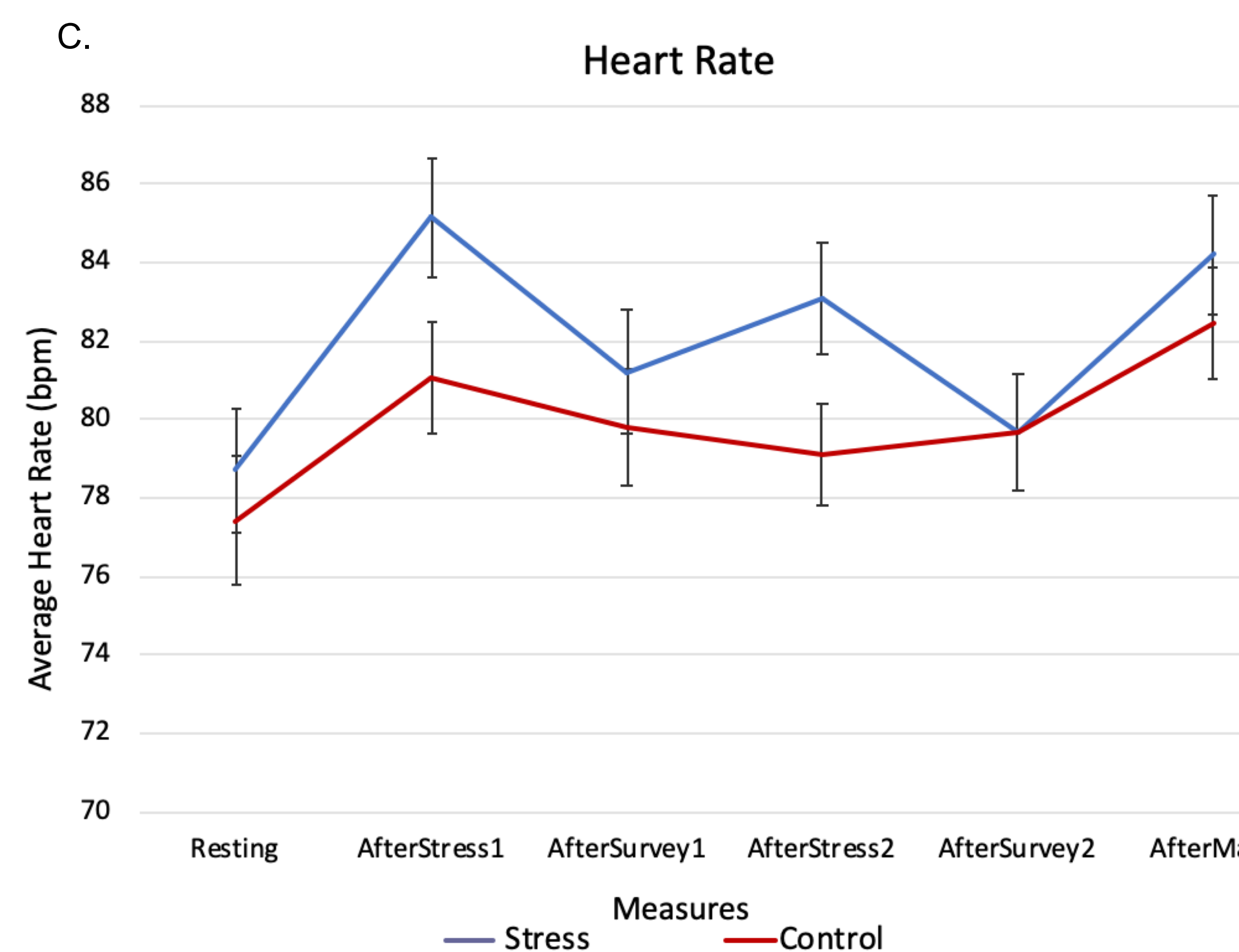
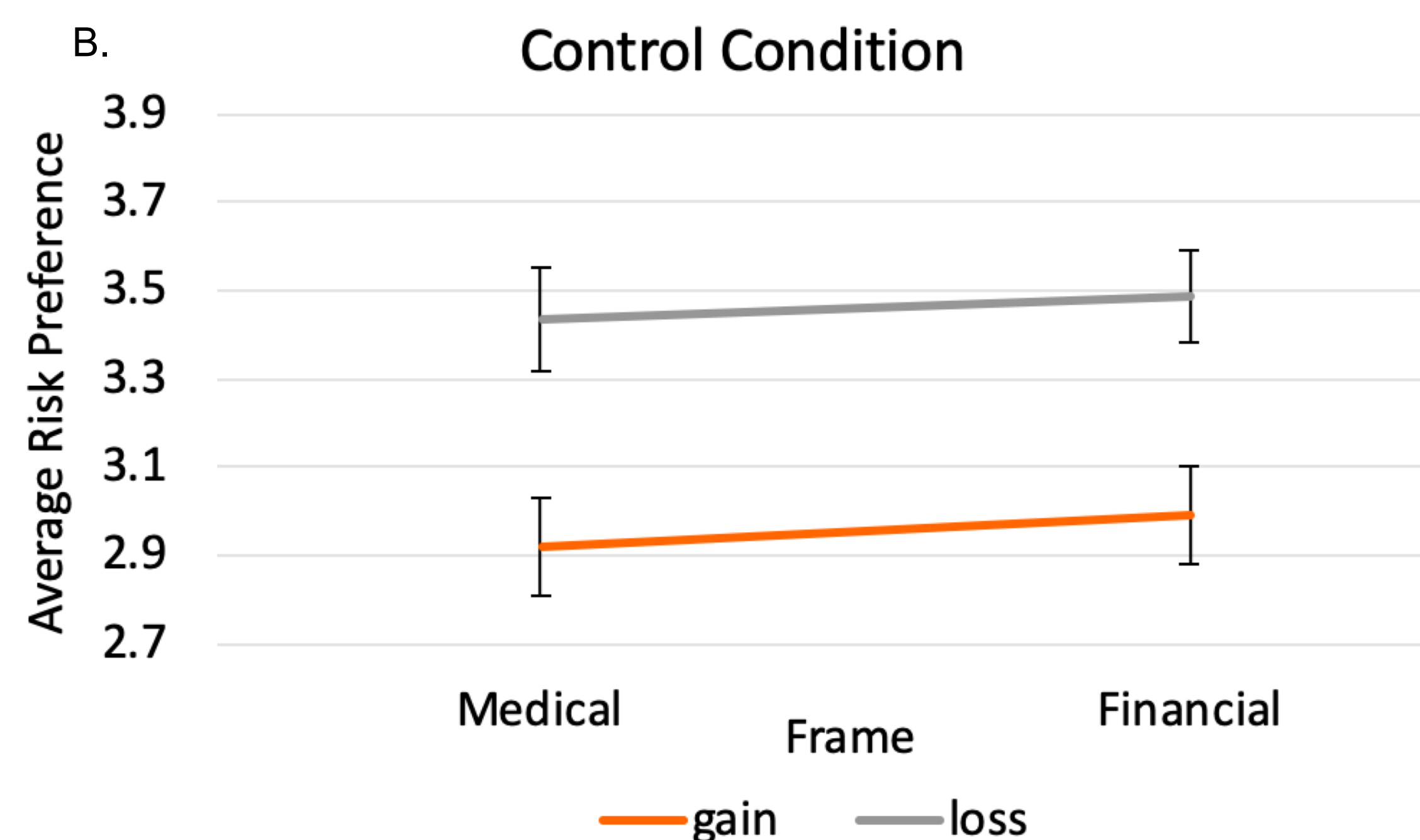
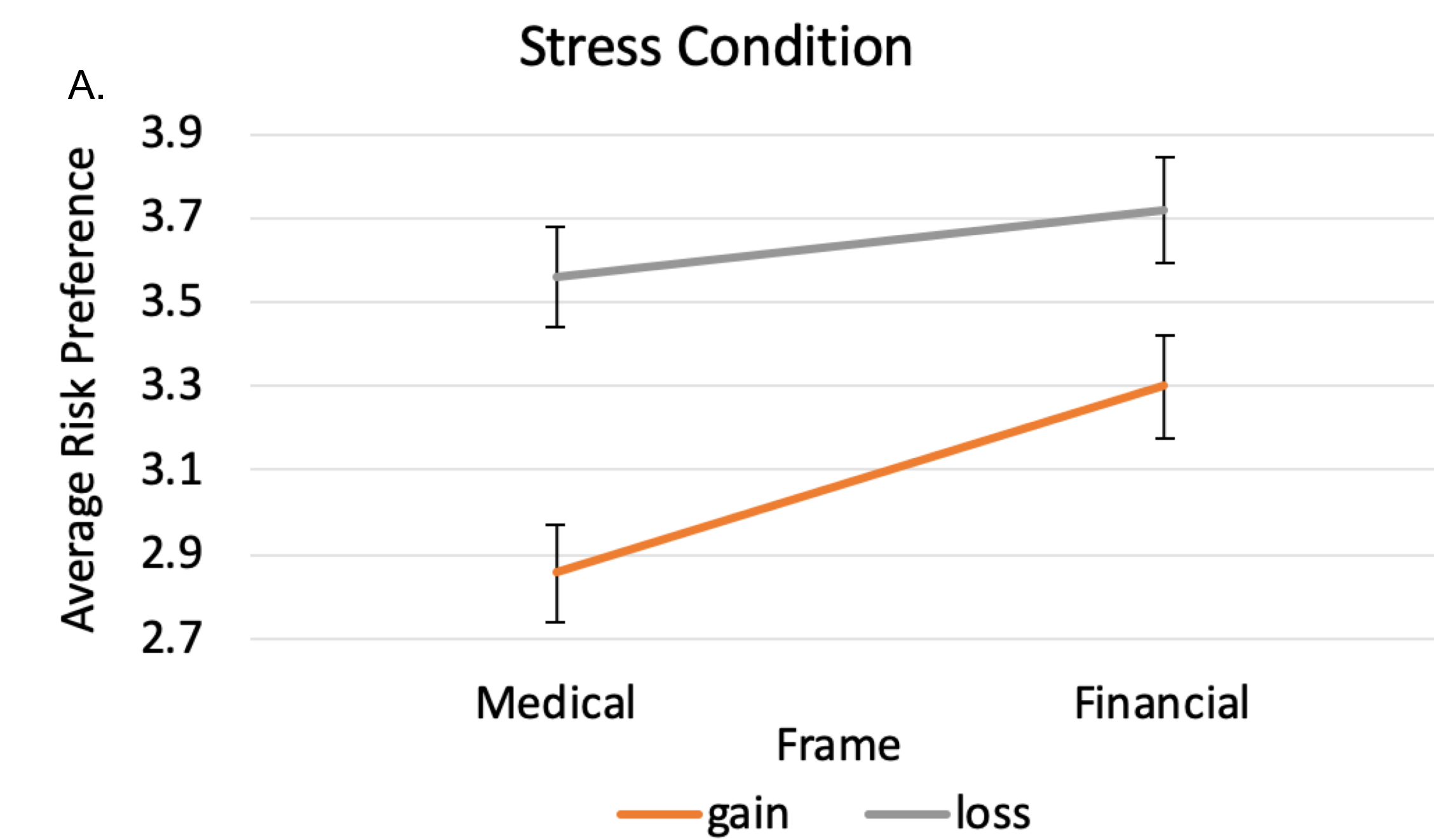
### Stress Condition

- Main effect of Frame,  $F(1,80)=38.426, p<.001, \text{partial } \eta^2=.324$ 
  - Greater preference for risk when problems framed as Loss ( $M=3.64, SE=.103$ ) than as Gain ( $M=3.08, SE=.098$ )
- Main effect of Domain,  $F(1,80)=7.108, p=.009, \text{partial } \eta^2=.082$ 
  - Greater preference for risk for problems in the Financial Domain ( $M=3.51, SE=.107$ ) than in the Medical Domain ( $M=3.21, SE=.104$ ).
- Frame x Domain,  $F(1, 80)=3.645, p=.06$  (marginal)
  - The framing effect (difference in risky choices between Loss and Gain conditions) in the Medical Domain ( $M=.701$ ) was marginally greater than in the Financial Domain ( $M=.417$ )

### Control Condition

- Main effect of Frame,  $F(1,85)=43.663, p<.001, \text{partial } \eta^2=.339$ 
  - Greater preference for risk in the Loss condition ( $M=3.46, SE=0.087$ ) than in the Gain condition ( $M=2.96, SE=.1$ )
- No other main effects or interactions,  $p's>.5$
- Notably, the Framing effect in the Medical Domain ( $M=.512$ ) was comparable to that of the Financial Domain ( $M=.494; p>.9$ ), suggesting that these two domains were treated identically when participants were not stressed.

## Figures



## Discussion

- Using a stress induction task analogous to situations of panic, numerical processing, and social stress that a physician might encounter, we find framing effects to be exacerbated when making life or death medical decisions, but not in the case of lower stakes financial decisions. This effect was not seen in the control condition.
- Surprisingly<sup>4</sup>, we found that stress led to a greater preference for risk for questions in the financial domain relative to the medical domain.
- Our findings reinforce the idea that different types of decisions being made may be uniquely susceptible to stress in the moment.

*More research needs to be done into how exactly the framing effect interacts with domain.*

## References

- Druckman, J. N., & McDermott, R. (2008). Emotion and the framing of risky choice. *Political Behavior, 30*(3), 297-321.
- Gu, R., Wu, R., Broster, L. S., Jiang, Y., Xu, R., Yang, Q., ... & Luo, Y. J. (2017). Trait anxiety and economic risk avoidance are not necessarily associated: Evidence from the framing effect. *Frontiers in psychology, 8*, 92.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science, 211*(4481), 453-458.
- Wang, X. T. (1996). Framing effects: Dynamics and task domains. *Organizational behavior and human decision processes, 68*(2), 145-157.
- Raghunathan, R., & Pham, M. T. (1999). All negative moods are not equal: Motivational influences of anxiety and sadness on decision making. *Organizational behavior and human decision processes, 79*(1), 56-77.
- Pabst, S., Brand, M., & Wolf, O. T. (2013). Stress effects on framed decisions: there are differences for gains and losses. *Frontiers in behavioral neuroscience, 7*, 142.
- Robinson, O. J., Bond, R. L., & Roiser, J. P. (2015). The impact of threat of shock on the framing effect and temporal discounting: executive functions unperturbed by acute stress?. *Frontiers in psychology, 6*, 1315.

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