

# Intentional Use of Logically Irrelevant Neuroscience Information

Lim M. Leong<sup>1</sup> & Craig McKenzie<sup>1,2</sup>

<sup>1</sup>Department of Psychology, UCSD, <sup>2</sup>Rady School of Management, UCSD

## Introduction

- Non-experts judge explanations that contain superfluous neuroscience as higher quality<sup>1,2,5</sup>
- One explanation for this **seductive allure effect** is a general preference for reductive explanations<sup>2</sup>
- We propose that people may infer from the level of granularity that the neuroscience info is informative and relevant (or else why include it?)<sup>3</sup>
- In related research, people judge explanations that include named categories as better because they can infer the existence of an underlying cause<sup>4</sup>

## Research Questions

1. Does the inclusion of irrelevant neuroscience info support additional inferences?
2. If people infer that the neuroscience is informative, do they intentionally rely on it in their judgements?

## Example Stimuli

### Infant Math

#### The Phenomenon

Babies are capable of doing simple arithmetic. For example, babies see a doll placed on a stage that is then hidden behind a screen. Then, they see a hand place another doll behind the screen. They look longer if the screen is dropped to reveal only one doll instead of two. This looking time difference between one and two dolls shows that babies can calculate  $1 + 1 = 2$ .

Why does this looking time difference show that babies can do arithmetic?

- In Exp 1, all explanations were bad and the inclusion of neuroscience info was manipulated<sup>5</sup>
- In Exp 2, all explanations contained neuroscience info and explanation quality was manipulated<sup>2</sup>

contact: [lmleong@ucsd.edu](mailto:lmleong@ucsd.edu)

<https://ucsd.zoom.us/j/5629945629>

## Experiment 1

Do people rely on the presence of neuroscience as a cue to infer the speaker's confidence?

### Neuroscience Info Condition

"Scans of the babies' brains show that the parietal lobe, known to be involved in math, governed how long babies looked at the stage. Researchers used this timing data, which is proportional to babies' liking of the display, to calculate their preferences."

### Statistical Info Condition

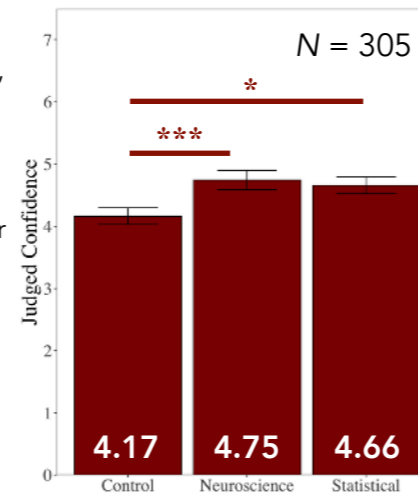
"Bayesian models show that the parameter related to math is associated with how long babies looked at the stage. Researchers used this timing data, which is proportional to babies' liking of the display, to calculate their preferences."

### Control Condition

"The researchers claim this happens because the amount of time the babies spent looking at the stage is directly proportional to how much they liked the display. The researchers used this timing data to calculate babies' preference for the single doll."

"How confident do you think Person A was in her answers?"

Compared to control, participants judged the speaker as more confident both when the explanations contained neuroscience info and when they contained statistical info



## References

- [1] Weisberg, D. S., Keil, F. C., Goodstein, J., Rawson, E., & Gray, J. R. (2008). The seductive allure of neuroscience explanations. *Journal of Cognitive Neuroscience*, 20(3), 470–477.
- [2] Hopkins, E. J., Weisberg, D. S., & Taylor, J. C. V. (2016). The seductive allure is a reductive allure: People prefer scientific explanations that contain logically irrelevant reductive information. *Cognition*, 155, 67–76.
- [3] Schwarz, N. (1994). Judgment in a social context: Biases, shortcomings, and the logic of conversation. *Advances in Experimental Social Psychology*, 26, 123–162.
- [4] Giffin, C., Wilkenfeld, D., & Lombrozo, T. (2017). The explanatory effect of a label: Explanations with named categories are more satisfying. *Cognition*, 168, 357–369.
- [5] Weisberg, D. S., Taylor, J. C. V., & Hopkins, E. J. (2015). Deconstructing the seductive allure of neuroscience explanations. *Judgment and Decision making*, 10(5), 429–441.

## Experiment 2

Do people fail to ignore the neuroscience info or do they intentionally use it to make their judgments?

### Good Explanation Condition

#### The Explanation

The part of babies' brains known to be involved in math is the parietal lobe. This brain area governs the babies' expectations about how many dolls there should be on the stage. The babies know that there should be two dolls on the stage, and their surprise at seeing only one leads to their looking longer.

Your task is to judge the quality of this explanation, which would range from very poor (-3) to very good (+3). But first, do you think that having the bolded text in the explanation would make your judgment of the quality of the explanation more or less accurate?

- I think my judgment of the quality of the explanation would be more accurate if I used the bolded text to some degree
- I think my judgment of the quality of the explanation would be more accurate if I completely ignored the bolded text

### Endorsed Using Info

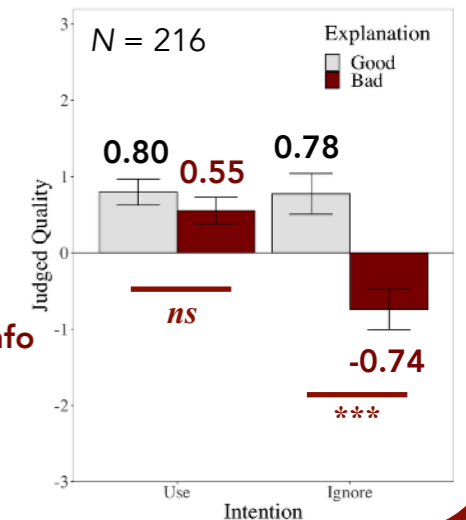
(67% or 145/216)

Gave high ratings to both good & bad explanations

### Endorsed Ignoring Info

(33% or 71/216)

Distinguished between good & bad explanations



## Conclusion

- People inferred that the speaker is more confident when their explanations contained neuroscience, and they intentionally rely on neuroscience info when judging the quality of explanations
- Judgements of explanation quality depend not only on the logical content of explanations, but also on the additional inferences they allow people to draw