

# Perception of Ratio Information

## When the Denominator Has More Relevance

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### Abstract & Intro

Numerical information is frequently presented in various ratio forms to communicate the odds of occurrence of events. However, when presented with ratio information, people are shown to be prone to the denominator neglect (Reyna and Brainerd 2008). Specifically, when the probability of occurrence of an event is represented by ratios of smaller (vs. larger) numbers (e.g., 1 out of 10 vs. 10 out of 100), people evaluate it as less likely because they focus on the numerator (10 is larger than 1) at the expense of factoring in the denominator.

Across six online studies (N = 3,225), we find evidence for the opposite: what we term the **denominator anchoring hypothesis** and show that in situations where an incident can affect several individuals (e.g., infectious disease), people evaluate the ratio information that are represented by smaller (vs. larger) denominators as more likely to occur. For example, when an infectious disease is said to infect 1 in 5 people, people evaluate the infection rate higher than when the disease is said to infect 20 in 100 people. We argue that this happens because of the perception of proximity (Zhang et al. 2010), hat is the ratio information that is represented by smaller denominators suggests to people that it takes less for the event to personally impact them than when the information is represented by larger denominators. We further show that the numerator neglect is stronger in people who live in less populated neighborhoods/cities or when the prospect is novel (versus settled).

### Overview of Studies

- Studies 1, 5a, 5b: Infectious disease
- Study 2: Side effects of a medication
- Study 3: Defective products
- Study 4: Failure rate of opening a new business
- Study 6: Crime rate

Zoom Link:  
<https://fordham.zoom.us/j/84253032031?pwd=MmJvUzVXa1RWdVRwY3NoQlJydWd5UT09>

Meeting ID: 842 5303 2031  
Passcode: 830156

### Study 5a

N = 403 (52% female, M<sub>age</sub> = 35), MTurk

### Study 5a: Method

This study is about a viral respiratory illness that can spread through human contact. Projections show that this disease will become widespread in 2025.

#### Large Denominator Condition

20 in 100 people will be infected

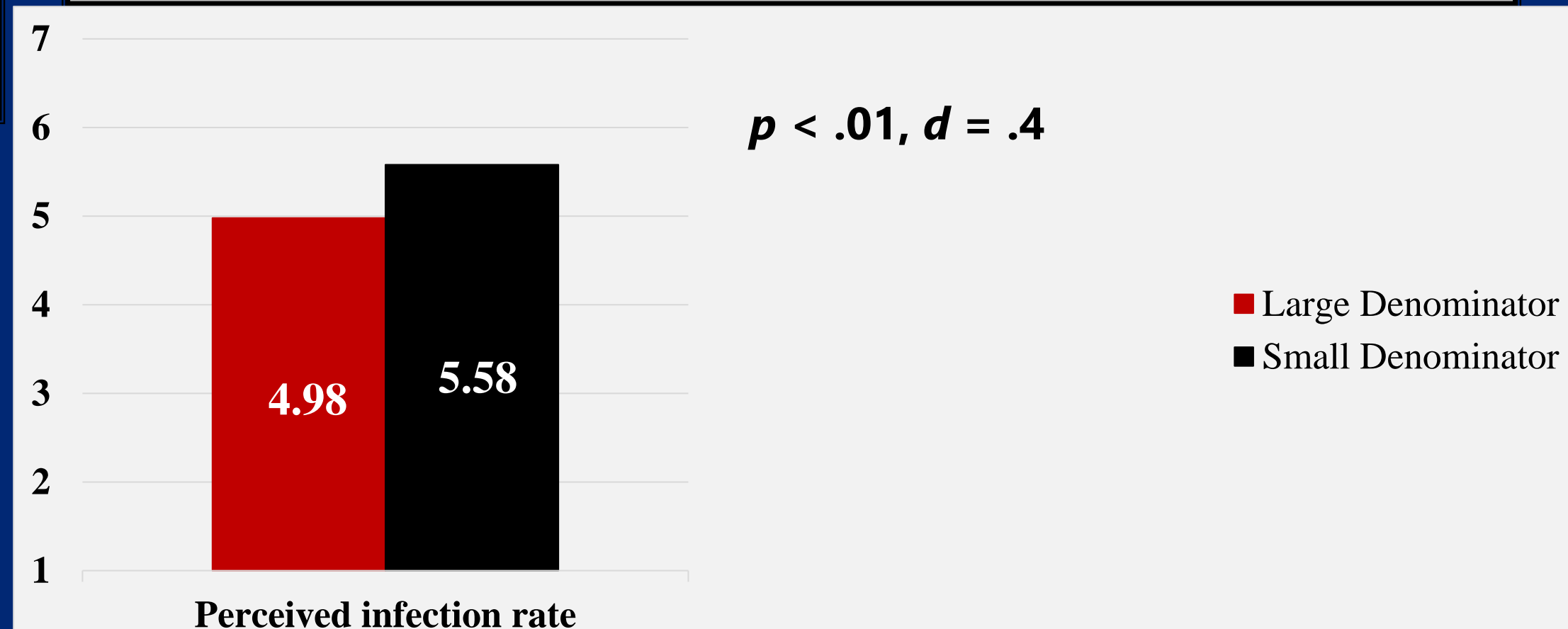
#### Small Denominator Condition

1 in 5 people will be infected

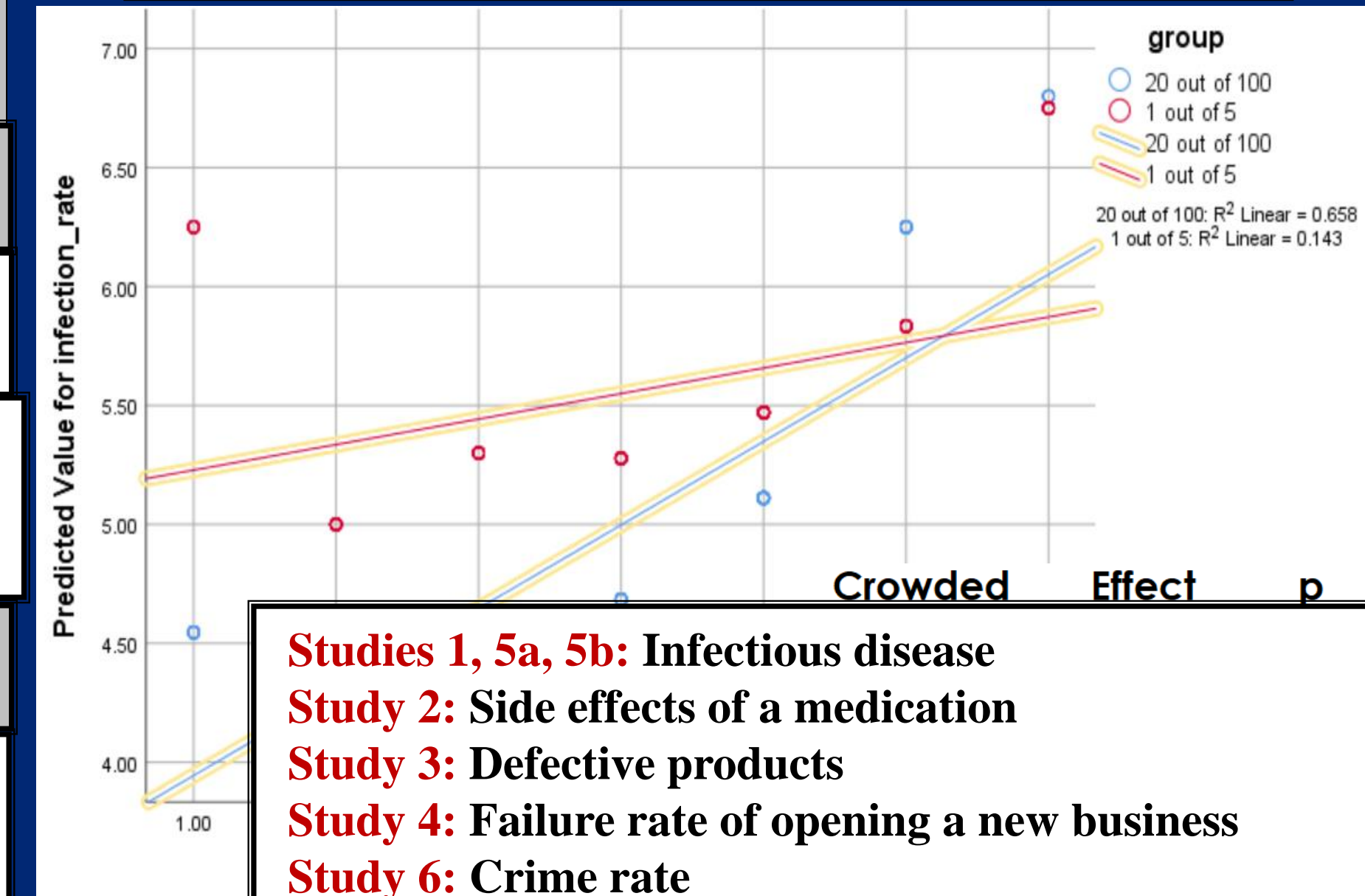
### Study 5a: Measures

- DV:** How do you evaluate the infection rate of this disease? (on a scale of 1 (extremely low) to 7 (extremely high))
- Mediator:** How likely do you think it is that someone you know personally will get infected? (on a scale of 1 (extremely unlikely) to 7 (extremely likely))
- Moderator:** How crowded is the neighborhood you live in? (on a scale of 1 (not at all crowded) to 7 (extremely crowded))

### Study 5a: Results Main Effect



### Study 5a: Results Moderation



### Study 5a: Results Mediation

