

Size doesn't matter

Lower price heuristics bias shopping decisions, regardless of math anxiety

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Introduction

- Many consumers base shopping decisions on price comparisons (POPAL, 2012): a task that may interact with math anxiety (Feng et al., 2014; Suri et al., 2013).
- Math anxiety (MA)** is a feeling of fear or tension when dealing with math (Ashcraft, 2002). The cognitive constraints of math anxiety have been shown to increase computational errors and impact an individual's ability to make advantageous choices (Suri et al., 2013; Peters et al., 2006).
- Physical size has been shown to influence decision processes by activating a **"bigger-is-better" (BiB)** heuristic (Meier et al., 2008).

Predictions

- Math-anxious consumers will make more errors on the purchasing task compared to less math-anxious consumers;
- Math-anxious consumers will be more likely to select the large product, even when the small product is the better deal (i.e., the BiB Effect), compared to their lower-math-anxious counterparts;
- The BiB Effect will intensify when the price difference between products is smaller (i.e., 5 to 10%) compared to when the price difference is larger (i.e., 30 to 40%).

Methods

- One hundred and eighty-six Mechanical Turk workers (98 males; mean age = 39.21) completed a 45-minute online questionnaire assessing math anxiety, general anxiety, and **purchasing behaviour** (see Figure 1). In 32 trials, consumers were presented two identical products offered at differing volumes and prices and asked to select the product that represented the "better deal."

Figure 1



Results

Prediction One

- An individual's level of MA was a significant predictor of performance on the purchasing task, even after controlling for gender and general anxiety, whereby those who were higher in MA had lower accuracy scores, $F(4, 181) = 3.98, p < .05$ (see Table 1).

Table 1

Relation between Math Anxiety and the purchasing task score (N = 186)

	B	SE _B	β	p
Gender	-.005	.020	-.017	.816
General Anxiety	.000	.001	.030	.684
Math Anxiety	-.005	.001	-.274	.000

Note. B = unstandardized regression coefficient; SE_B = standard error of the coefficient; β = standardized coefficients.

Prediction Two

- The BiB Effect was determined by calculating proportion of errors. The number of times the larger item was incorrectly selected was divided by the overall number of errors made during the task.
- An individual's level of MA was not a significant predictor of the BiB Effect, $F(4, 181) = 0.816, p > .05$ (see Table 2).
- Further, and regardless of an individual's level of MA, a univariate ANOVA revealed that consumers were not selecting the larger product more frequently when committing purchasing errors, $F(4, 181) = 0.179, p > .05$.

Table 2

Descriptives for Math Anxiety and the BiB Effect (N = 186)

Math Anxiety	N	Mean BiB Effect	Std. Deviation
Lower	87	0.379	0.295
Higher	99	0.393	0.260

Prediction Three

- Given the lack of evidence supporting the BiB Effect theory, the analysis required to test our third prediction was not conducted.

Exploratory analyses

- In the purchasing task, price and size were confounded. The larger product was always more expensive compared to the smaller product.

Were decisions based on a price heuristic rather than a size heuristic?

- A one sample t-test revealed that consumers, irrespective of their level of MA, selected the smaller product more often (M = .52) than the large product (M = .39) when committing errors, $t(185) = 23.87, p < .001, d = .47$, suggesting the use of a price heuristic ("when in doubt, spend less").

Would our third prediction hold for the price heuristic effect?

- A one sample t-test showed a significant difference between effects for small versus large price differences, $t(185) = 23.27, p < .001, d = .58$. Consumers were more likely to pick the small product when the price difference was small (harder; M = .53) compared to when it was large (easier; M = .32).

Discussion

- Though higher-MA participants made more errors overall, they relied on the price heuristic to the same degree as their lower-MA peers.

Limitations

- Participants were given unlimited time to select a product. Cognitive shortcuts may require a sense of urgency to be activated (Strough et al., 2011).

Zoom Link

- If you have any questions, comments, or would just like to say hello, please use these details to join my Zoom session:

- **Meeting ID:** 931 1167 3635
- **Passcode:** Sjdm2020

- For a complete list of references, contact Andie at astor074@uottawa.ca.