Numeracy, numeric attention, and number use

Kevin E. Tiede[1], Pär Bjälkebring[2], & Ellen Peters[3]

[1]University of Konstanz, Germany [2]University of Gothenburg, Sweden [3]University of Oregon

I Introduction

Numeracy

- Numeracy is the ability to understand and use probabilistic and numerical concepts[1]

Numeracy and the use of numbers

- People higher (vs. lower) in numeracy use numeric information more when numeric and non-numeric information is available[e.g., 2,3]

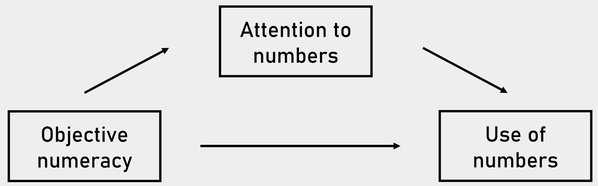
Why do more (vs. less) numerate people use numbers more?

Numeracy and attention to numbers

- People higher (vs. lower) in numeracy are more inclined to work with numbers[4] and sample more outcomes in decisions from experience[e.g., 5]
- However, there is little research directly testing the relation of numeracy and attention to numbers
- It is also unclear whether the actual ability (objective numeracy) or the preference for numbers (subjective numeracy) drives numeric attention[1]

Numeric attention as a mediator

- The more people look at a piece of information, the more they use it when making decisions[e.g., 6]
- Therefore, we hypothesize that attention to numbers mediates the relation of objective numeracy and use of numbers:



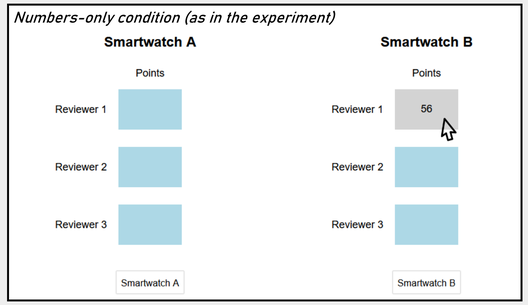
M Method

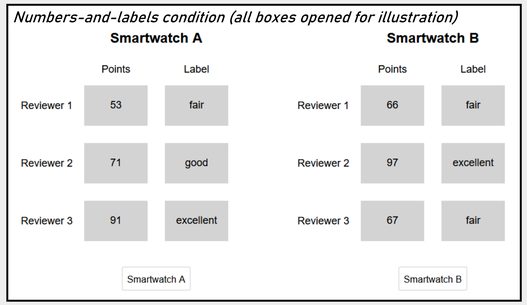
Experiment (pre-registered)

- Participants were asked to choose repeatedly between two products
- For each product, three reviewer ratings were provided
- In the *numbers-only* condition, only numeric ratings (0–100) were provided
- In the *numbers-and-labels* condition, both numeric ratings and respective verbal labels (e.g., "good") were provided
- Crucially, in half of the trials the mean numeric rating and the "mean" verbal rating suggested different products
- Participants were considered as using numbers (vs. labels) when they chose the option suggested by the numeric ratings

Mouselab

- Ratings were hidden behind Mouselab boxes
- Participants had to hover their mouse cursor over a box to open it





Measures

- Objective numeracy
- Subjective numeracy
- Intelligence

Sample

- N = 399
- MTurk sample

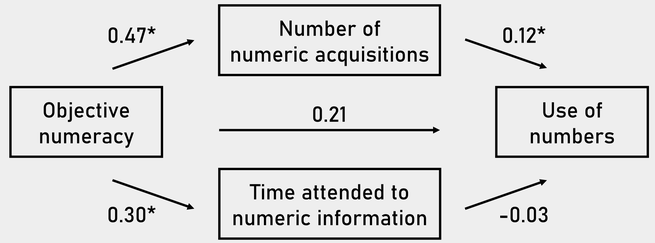
R Results

Numeracy and number use

- People higher (vs. lower) in objective numeracy used numeric information more (b = 0.28, p = .001); no effect of subjective numeracy or intelligence

Numeracy, numeric attention, and number use

- A multilevel SEM showed that people higher (vs. lower) in objective numeracy looked more often and longer at numeric information
- The number of times people attended to numeric information fully mediated the association of objective numeracy and number use (indirect effect: b = 0.06, p = .010)
- no effect of subjective numeracy or intelligence



*p < .05

D Discussion

- Our research shows that people higher (vs. lower) in objective numeracy use numbers more at least partly because they attend to it more
- These findings help to understand the underlying processes of the effects of numeracy and can help to develop decision aids which require the use of numbers

@ Contact

Kevin E. Tiede
✉ kevin.tiede@uni-konstanz.de
@kevinetiede

Zoom link

https://zoom.us/j/6664766504?pwd=TitVbUVYWk9qUU9wbkxFdkRTcm9kQT09

References

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