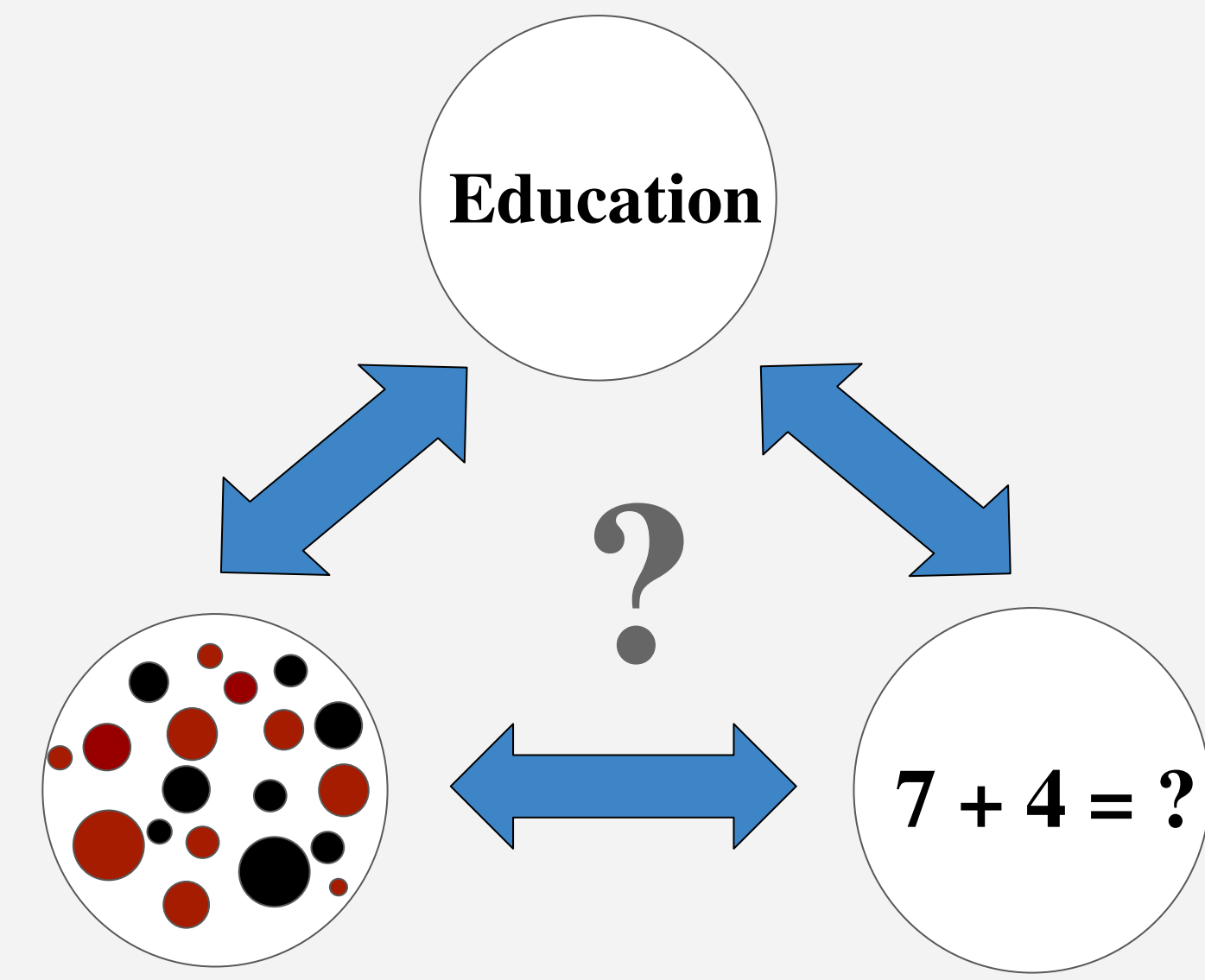




Does number estimation support math abilities? Evaluating the role of education in the Tsimane'

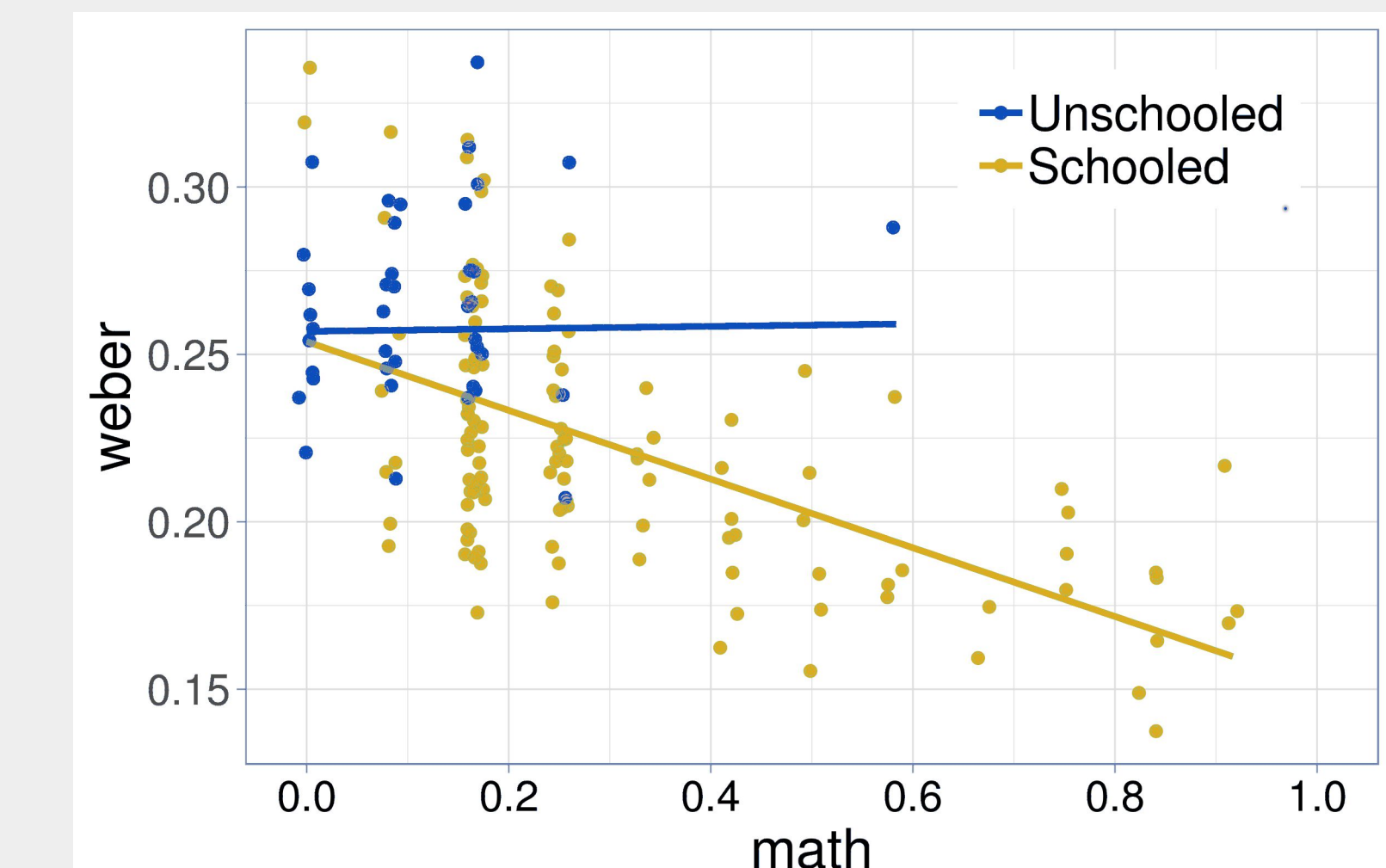
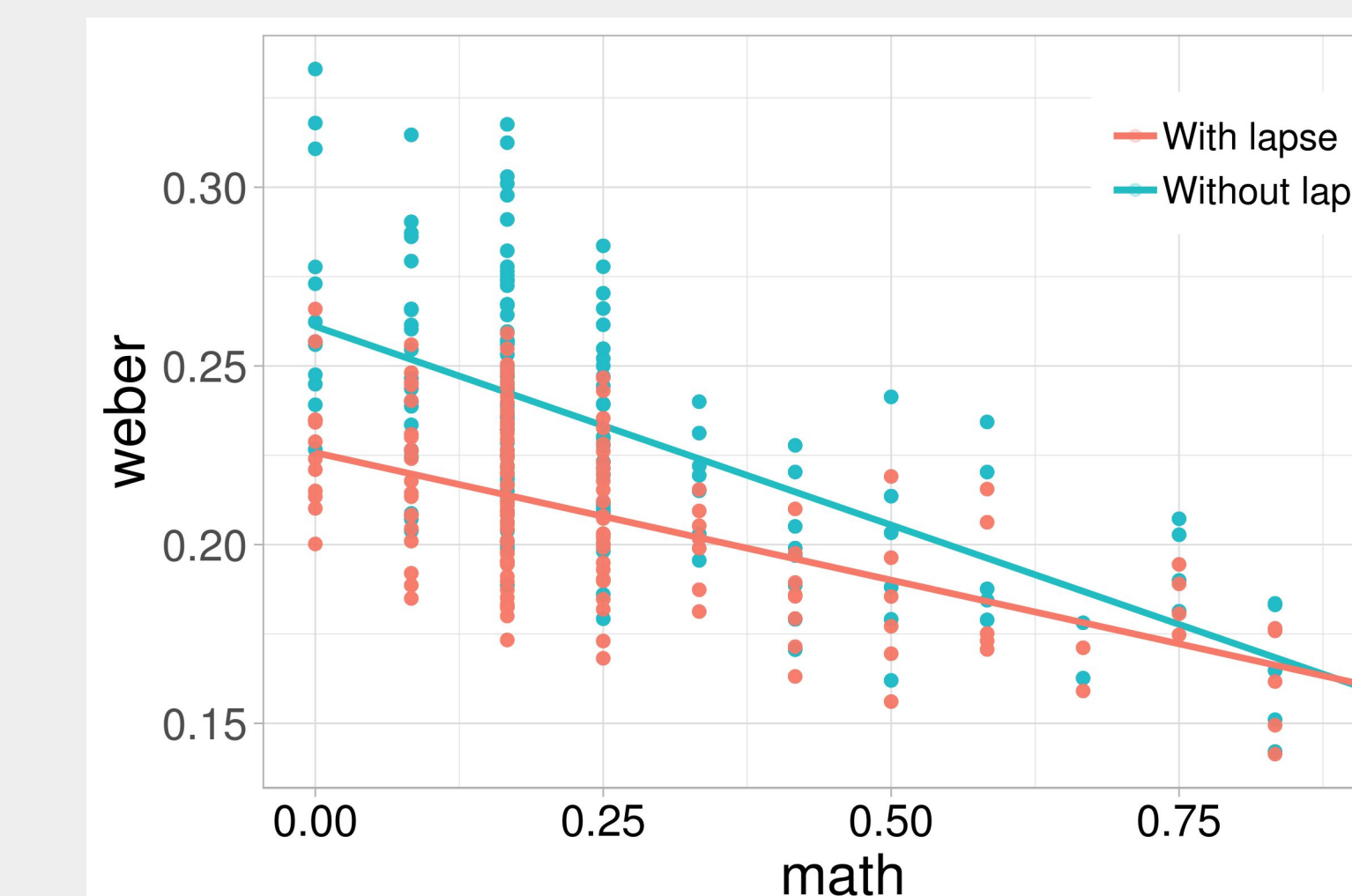
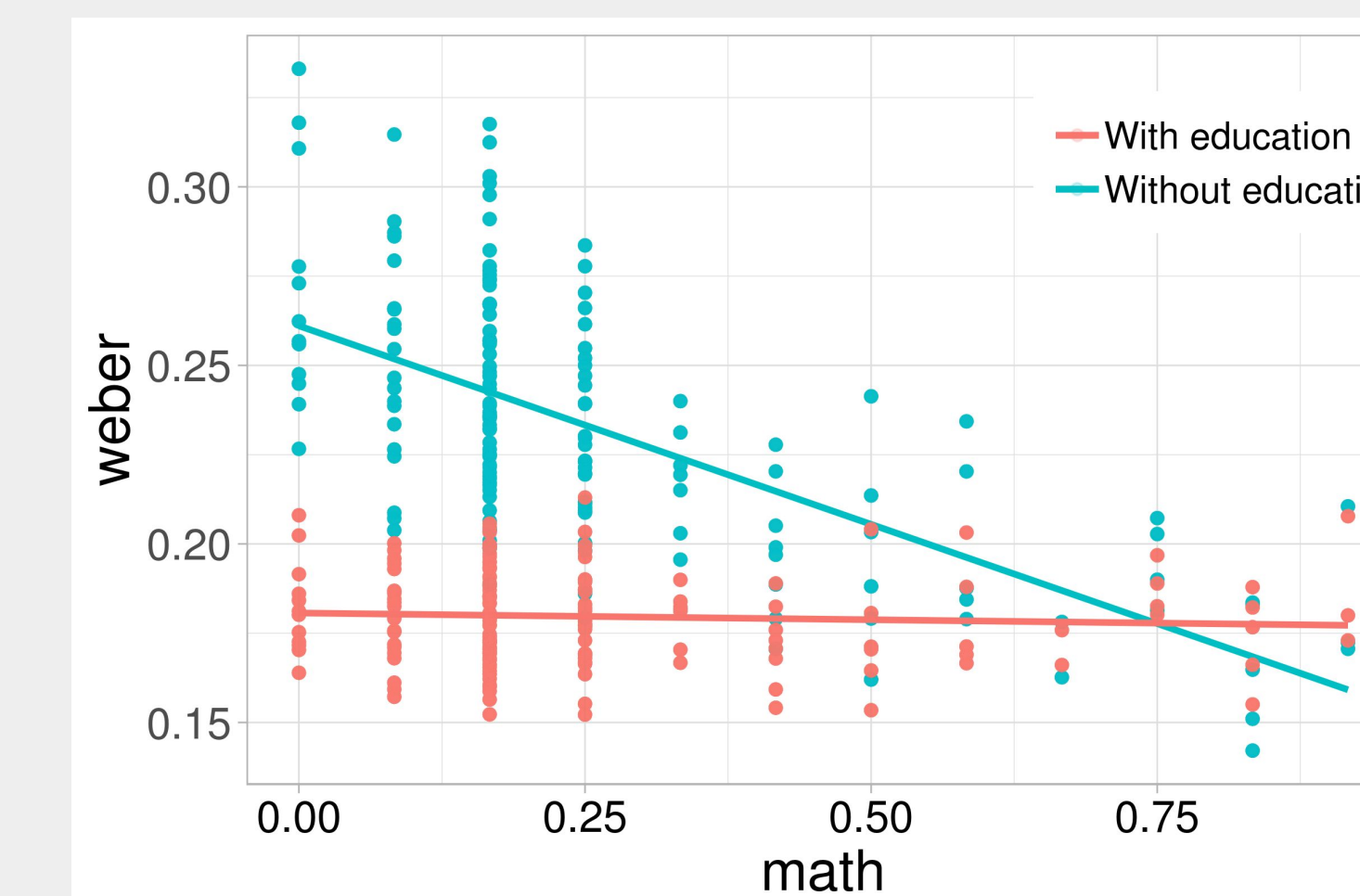
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Results

- ❖ Math strongly predicts ANS acuity when education is not controlled. However...
 - When education *is* controlled, the effect disappears.
 - The effect of math on ANS acuity diminishes when attentional lapses are controlled also.
 - There is, in fact, *no relationship* between the ANS and math in unschooled adults..



Conclusion

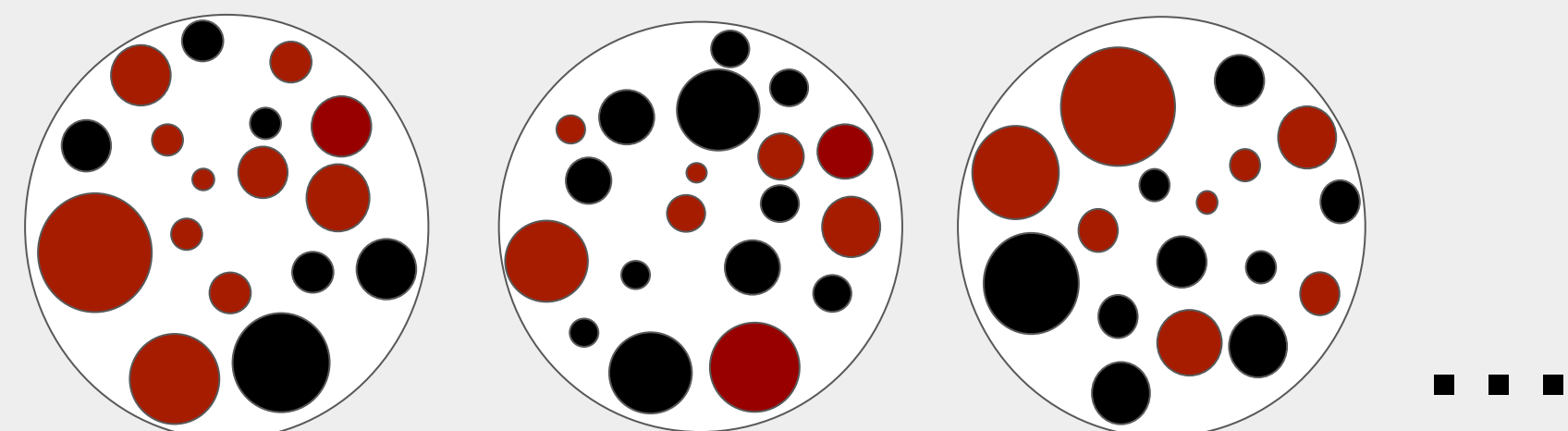
- ❖ Education seems to mediate the relationship between ANS acuity and math skill.
- ❖ It is plausible that education may cause the ANS ~ math link to exist in the first place.
 - Perhaps formal schooling increases inhibitory control or attention.
 - This would be consistent with inferred *attentional lapses* explaining some of the relationship between math and ANS acuity.

Introduction

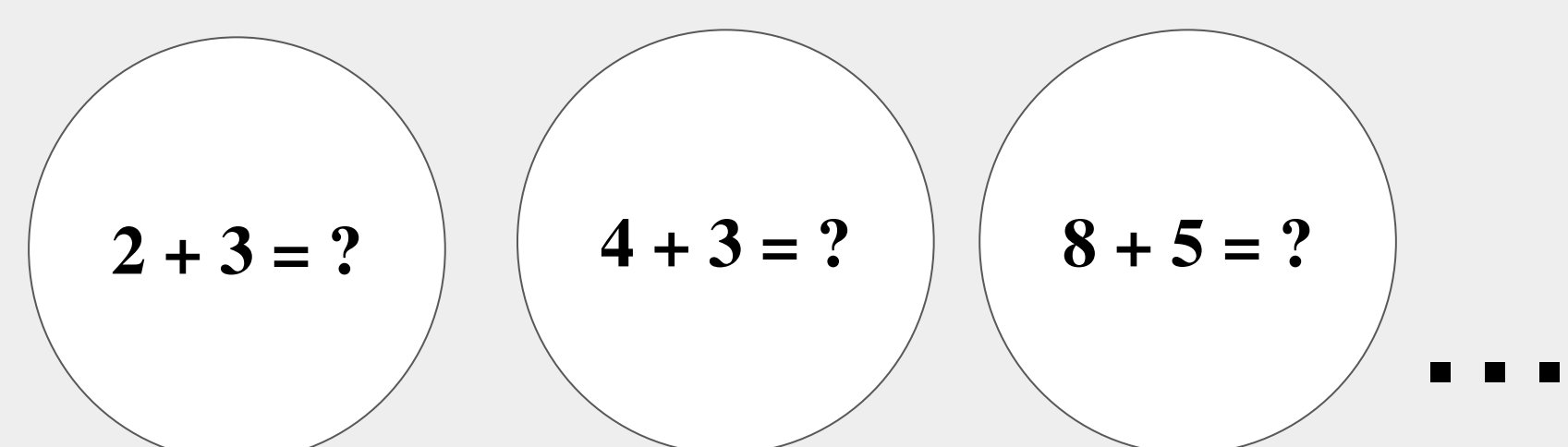
- ❖ Approximate number system (ANS) acuity correlates with math abilities in children.
 - Researchers have speculated that there may be a *causal link*: ANS → math.
- ❖ Education is also known to correlate with ANS acuity.
- ❖ Here we ask: **How are education, math ability, and ANS acuity related?**

Methods

- ❖ We recruited 164 Tsimane' ages 15-77 to participate in ANS and math tasks.
 - **ANS task:** quantity discrimination.

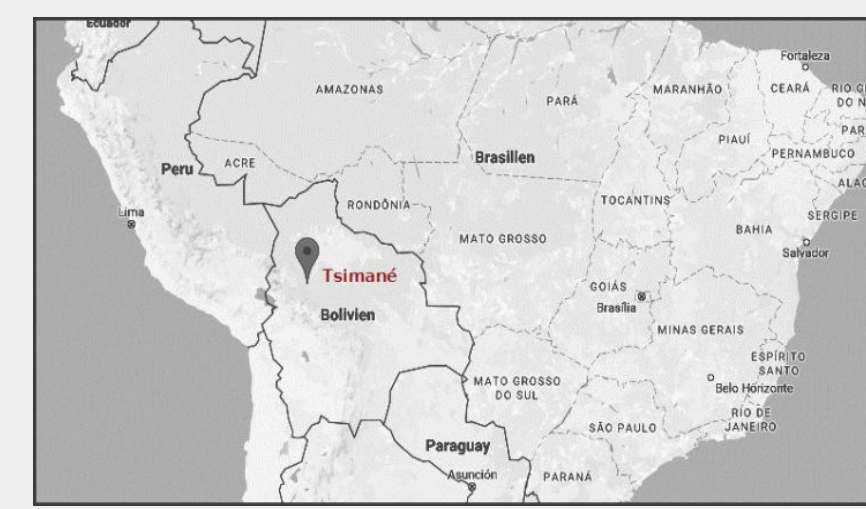


- **Math task:** arithmetic problems.



- ❖ Used a hierarchical Bayesian model to infer participants' Weber fractions (ANS acuity) and, jointly, the effects of education, math, and attentional lapses.

Why the Tsimane'?



- ❖ The Tsimane' are an indigenous population of farmer-foragers in the Bolivian Amazon.
- ❖ Evaluating the relationship between education, age, math, and ANS acuity in WEIRD populations is difficult because of lack of variation in schooling at different ages.
- ❖ In Tsimane', there is a wide amount variation in schooling by age:

