

Comparing certainty within and across dimensions in childhood (#16731)

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1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

2) What's the main question being asked or hypothesis being tested in this study?

Is there a difference in children's metacognitive sensitivity (i.e., their accuracy for trials they chose as higher certainty vs. those they chose as lower certainty) within a domain versus between domains?

3) Describe the key dependent variable(s) specifying how they will be measured.

1. Accuracy on perceptual trials that are chosen (high certainty)
2. Accuracy on perceptual trials that are not chosen (low certainty)
3. The reaction time to make certainty judgments

4) How many and which conditions will participants be assigned to?

Children will see trials within-domain and between-domain (within-subject). The within-domain will be either two sets of number, area, or emotion recognition trials; between-domain will be the cross-combination of those three (number/area, number/emotion, area/emotion).

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

The following analyses are based on those performed in DeGardelle & Mamassian, 2014 and DeGardelle, LeCorre & Mamassian, 2016:

1. Repeated Measures ANOVA comparing accuracy on trials that are chosen against trials that are not chosen, comparing within-domain and between-domain conditions.
2. If there is an (unpredicted) interaction in (1), follow-up paired sample t tests comparing chosen trial accuracy against unchosen trial accuracy in within-domain condition and between domain-condition.
3. In addition, a Bayesian Repeated Measures ANOVA (with the default prior set in JASP) comparing accuracy on trials that are chosen against trials that are not chosen, comparing within-domain and between-domain conditions. We will report the Bayes Factor in favor of the null model for the interaction of Choice x Domain as an additional check for the validity of any null effects.
4. Paired samples t test of reaction time for certainty choice within versus between trials.
5. In addition, a Bayesian paired-sample t test (with default prior set in JASP) comparing reaction time for certainty choice within versus between trials. We will report the Bayes Factor in favor of the null effect.

6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

Children must complete the entire task to be included in the analyses. Children with any developmental disorders reported by the parents and/or teachers will be excluded. Children will only be tested in the study if they are able to carry a simple conversation in English (e.g., state their name), talk about at least one popular cartoon character from a warm-up sheet, or their parents indicate that they hear English over 25% of the time (depending on what information is available to the researcher at the time of testing).

Reaction times outside of 2.5 SD for any individual child will be removed from RT analysis, but associated accuracy data will be kept.

7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

24 kids per age group (6 and 7)

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

We are measuring the following but do not consider them "key dependent variable(s)":

1. Difference score on accuracy (i.e. accuracy on chosen trials minus accuracy on unchosen trials)
2. The reaction time on perceptual trials that are chosen (high certainty)
3. The reaction time on perceptual trials that are not chosen (low certainty)
4. Age of participant

Secondary Analyses:

-Analogous Repeated Measures ANOVAs as 5-1 above for each of the three dimensions separately: a number ANOVA (number within vs. number/area and number/emotion between); an area ANOVA (area within vs. area/number and area/emotion between); and an emotion ANOVA (emotion within vs. emotion/number and emotion/area between).

- Analysis #1 above with age as a co-variate.
- Analysis #1 above with chosen vs. unchosen response time in place of accuracy.

Analyses for a separate hypothesis:

- A Repeated Measures ANOVA with Dimension (number/area/emotion) as the IV and the average accuracy (i.e., combining chosen and unchosen) on each dimension's discrimination trials.
- A Pearson correlation matrix between the accuracy scores for each dimension's discrimination trials.
- A Repeated Measures ANOVA with Dimension (number/area/emotion) as the IV and the within-dimension difference score between chosen vs. unchosen accuracy as the DV.
- A Pearson correlation matrix between the difference scores for the within-dimension difference scores.
- A partial correlation matrix between the difference scores for the within-dimension difference scores controlling for the discrimination accuracy scores on those same pairs of dimensions.