Preregistration of Evaluating bundles of numbers 3

Simon Farrell[1], Geoff Ward[2], Mark Hurlstone[1], Gordon D A Brown[3], Alice Mason[1]

[1] University of Western Australia

[2] University of Essex

[3] University of Warwick

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Study Information

Title	Evaluating bundles of numbers 3

Research questions

- How does the position of a value in a sequence determine evaluation of that sequence?
- To what extent does memory predict sequence evaluation?

Hypotheses

1. Recalled information is a better predictor of evaluation than presented information (i.e., the entire sequence)

Sampling Plan

60 participants will be recruited via Prolific Academic to participate in the experiment online. The inclusion criteria are

- Age > 18 and < 65
- Prolific Academic approval rate > 90%
- Country of residence is UK, USA, Ireland, Australia, New Zealand or Canada
- English as first language (self-report)
- Haven't completed previous experiments in this series

Existing data   **Registration prior to creation of data**. As of the date of submission of this research plan for preregistration, the data have not yet been collected, created, or realized.

Data collection procedures   60 participants will be recruited via Prolific Academic to participate in the experiment online. The inclusion criteria are

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- Country of residence is UK, USA, Ireland, Australia, New Zealand or Canada
- English as first language (self-report)
- Haven't completed previous experiments in this series

Study is expected to be completed in less than 3 days.

Sample size   60 people

Sample size rationale   Initial sample size is arbitrary, based on money considerations. (Bayesian statistics mean power analysis is inappropriate)

Stopping rule	Data will be analysed after collecting 60 participants. If key Bayes Factors are not sufficiently diagnostic (BF>0.1 and BF<10) further batches of 10 participants will be run and analysed to a maximum of 100 participants (an upper limit imposed by money constraints)

Variables

- Task (recall vs evaluate)
- Serial position of items

Manipulated variables	
	- Task (recall vs evaluate)
	- Task order (recall and then evaluate, vs evaluate and then recall), post-cued

Measured variables	
	- Which items from the list were recalled (i.e., items from which serial positions on the presented sequence)
	- Maximum price willing to pay

Indices	Lag-CRP functions will be constructed for each participant following the description in Kahana (1996)
	Kahana, M. J. (1996). Associative retrieval processes in free recall. Memory & Cognition, 24, 103-109.
	These will be calculated overall, and conditional on correct initial recall of the highlighted item

Design Plan

Study type	**Experiment**. A researcher randomly assigns treatments to study subjects, this includes field or lab experiments. This is also known as an intervention experiment and includes randomized controlled trials.

Blinding	No blinding is involved in this study. YES
	For studies that involve human subjects, they will not know the treatment group to which they have been assigned. YES
	Personnel who interact directly with the study subjects (either human or non-human subjects) will not be aware of the assigned treatments. (N/A)
	Personnel who analyze the data collected from the study are not aware of the treatment applied to any given group. NO: manipulated factors will be named in the data file

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Study design	All factors are manipulated factorially within-subjects.

Randomization	Trials from each cell of the task x serial position factorial will be randomly intermixed. The values on each list are randomly generated.

Analysis Plan

Statistical models

Recall analysis

- A mixed effects logistic regression predicting recall probability from serial position and task order. Effects will be assessed using Bayes Factors.
- A lag-CRP function [Kahana, M. J. (1996). Associative retrieval processes in free recall. Memory & Cognition, 24, 103-109.] will be calculated for each participant in each condition. These will be subject to an ANOVA, the effect of lag being assessed using a Bayes Factor.

Evaluation analysis

- The evaluation will be predicted from the values at each serial position.
- Posteriors on the regression coefficients will be obtained using a hierarchical Bayesian analysis.

Joint analysis

- Memory and evaluations will be jointly fit using a hierarchical Bayesian model. Evaluations will be predicted from presented or recalled values on a trial-by-trial basis. Under one model, evaluations are predicted from the average of all presented values on a trial; under the other they are predicted from the average of all values recalled by that participant on that trial.
- A secondary analysis will examine whether the memory-evaluation relationship in previous analysis is modulated by task order.

Transformations	N/A

Follow-up analyses	None

Inference criteria	Bayes Factors, or posteriors on model parameter estimates, will be used to perform inference.

Data exclusion

- Participants will be excluded if they do not meet the following criteria:
- At least 80% of trials are completed
- At least one item is correctly recalled on average in memory task

Missing data For mixed effects modelling and Bayesian modelling, missing data will not present a major issue under criterion of 80% complete data set per participant. For the Bayesian ANOVA, participants with missing cells will be omitted from the analysis.

References