Checklist for Reporting Reaction Time Pre-Processing Decisions, version 3

This version of the checklist was re-submitted to the "Cortex" journal after it underwent a major revision.

This checklist can be used by authors to ensure they reported their data pre-processing in sufficient detail, by reviewers to get a quick overview on methods used and by researchers new to the field who want to learn about common approaches. We recommend all users to thoroughly go through the different pre-processing actions and reflect on whether they reported them (checkbox **reported**) or whether these actions are not applicable (checkbox **NA**). If reported, please add, ideally, the corresponding **page number** in the manuscript (or preprint) to facilitate the review process. Authors should include the corresponding page numbers if they have provided any justifications for **not** performing certain pre-processing actions.

For cases where no or only some pre-processing has been applied, it doesn't make sense to upload an (almost) empty checklist. Instead, we would like to recommend the following sentences in the analysis section of the manuscript:

- When no pre-processing was done: "In our analysis, we have used unpreprocessed (raw) data."
- If the authors conducted only parts of the pipelines, they should explicitly state: "First, we excluded erroneous data, then RT >2000ms or <150ms. No other preprocessing actions were performed."

Section	What to report?	Examples and suggestions	Reported	NA	On page
			☒	☒	p. X-Y
General	Order	"The reporting order reflects the data pre-processing order." or "Only trials followed by a correct response were incorporated in the reaction time (RT) analyses (…) (please note that error rates were arcsine transformed prior to the analysis to approximate normal distribution). (...) Subsequently, possible decade as well as five break effects were computed as follows for each participant individually: first, the logarithm (ln) of the averaged response latencies per experimental number pair (both orders collapsed; e.g. 3:5 and 5_3) was calculated. Then, a logarithmic function (…) was fitted to these individual data. (…) Afterwards, the (…) the residuals were computed by subtracting the predicted values from the actual logarithm of the RT. Finally, these residuals were standardized to a mean of 0 and a standard deviation (SD) of 1 (…)." (Domahs et al., 2010)	☐	☐	_____
	Transparency (e.g., reporting discrepancies between pre-registered and actually used pre-processing pathways)	"Our confirmatory analyses do not deviate from the pre-registered procedure. All datasets and the analysis code are available for download on the OSF." (Primbs, Holland et al., 2023) or "The deviation between planned and executed pre-processing actions has been addressed in section X."	☐	☐	_____

Section	What to report?	Examples and suggestions	Reported	NA	On page
			☒	☒	p. X-Y
	Theoretical or empirical justification for chosen pre-processing actions	"RTs ≤ 100 ms we removed as they reflect implausible cognitive processing of the Go signal (Gabay & Behrmann, 2014 as cited in De Pretto et al., 2021)." or "Theoretical or empirical justification for chosen pre-processing actions has been provided in the respective sections of the present manuscript."	☐	☐	_____
Participants	Total number of participants collected	"A group of 16 participants (five women, 11 men, 18–50 years of age) participated in this experiment. They all had a normal (or corrected-to-normal) vision and gave their informed consent." (Burle et al., 2014)	☐	☐	_____
	Total number of participants excluded per reason for exclusion (participant-level data exclusion)	"After application of our pre-registered exclusion criteria, a final sample size of 155 participants remained. Please note that most excluded participants (n = 102) did not actually complete the experiment – they failed the attention check presented during the instructions and were directly forwarded to the end of the experiment, skipping all experimental trials. The other participants were removed because they were too slow (3SD from the mean reaction time; n = 3) or made too many mistakes (n = 2)." (Primbs, Rinck, et al., 2022)	☐	☐	_____
	Total number of participants (per condition) included in final analysis	"As pre-registered, we recruited 100 participants who fulfilled our inclusion criteria (at least 18 years old, fluent in English) and completed the online study via the research platform Prolific. Of those, 9 fulfilled our pre-registered exclusion criteria (…), leaving the data of 91 participants to be analyzed." (Rinck et al., 2022)	☐	☐	_____
Materials	Number of trials (per condition, per participant)	"Eight models (…) were selected from the Radboud Faces Database on the basis of how well their emotional expressions were recognized in a validation study (RaFD; Langner et al., in press). (...) Subsequently, pictures of the three emotional expressions central to this experiment were selected per model, namely happy, sad, and angry. This resulted in a total of 24 pictures: three expressions x two ethnicities x four targets (models) per ethnicity. (...) Each experimental block consisted of sixteen pictures randomly displayed five times, resulting in 80 trials per experimental block." (Bijlstra et al., 2010)	☐	☐	_____
	Stimuli-level data exclusion	"Criteria for item selection were high discriminatory power, high convergent validity with openness for experience, as well as content validity, based on expert judgment." (Mussel et al., 2011)	☐	☐	_____

Section	What to report?	Examples and suggestions	Reported	NA	On page
			☒	☒	p. X-Y
Analysis	Proportion of trials included in final analysis / proportion of trials excluded for a particular reason	“For each participant, we first removed all RTs exceeding two standard deviations from the grand mean. Across participants, RTs <214 ms (0.6%) and RTs <512 ms (3.7%) were excluded from further analyses.” (Wühr & Ansorge, 2005)	☐	☐	_____
	Type of Trial-level data exclusion	"For the minimum threshold, we varied the response time cut-off from 0ms to 300ms in steps of 50ms, resulting in 7 levels. For the data-based outlier trimming method we varied the number of median absolute deviations from the median (Leys et al., 2013) from 1 to 3 in steps of 0.5 or applied no data-based trimming, resulting in 6 levels." (Primbs, Rinck, et al., 2022)	☐	☐	_____
	Data Transformation	"Separated repeated measures analyses of variance (rmANOVAs) were conducted to investigate one-session and two-week training effects on median RTs, arcsine-square-root-transformed error rates, and inverse efficiency scores." (Soltanlou et al., 2018)	☐	☐	_____
	Data Aggregation	"Most often the mean RT within each trial type is calculated (…). Researchers may opt to use the median RT instead. I included both options." (Parsons, 2022)	☐	☐	_____
	Reason for choosing a specific method	“Logarithmic fitting was chosen (…) because of evidence for a logarithmically compressed quantity representation.” (Domahs et al., 2010) or “Using the mean or the median as central tendency statistics alone may conduce to biases and increase the risk of falsely rejecting null hypotheses (Morís Fernández & Vadillo, 2020; Rousselet & Wilcox, 2020). (...) Among other alternative approaches (Ging-Jehli et al., 2021), using a theoretical distribution to describe and compare the shapes of different RT distributions has been proposed (Castellanos et al., 2006; Van Zandt, 2000). The most widely used theoretical distribution in ADHD research is the ex-Gaussian distribution.” (Bella-Fernández et al., 2023)	☐	☐	_____

* *Note:* The checklist provided here is primarily based on the conventions commonly followed in psychology. However, it is important to note that users have the flexibility to adapt and customize the checklist according to the guidelines of their specific research discipline.

Further Information: Loenneker, H.D., Buchanan, E.M., Martinovici, A., Primbs, M.A., Elsherif, M.M., Baker, B.J., Dudda, L.A., Đurđević, D.F., Mišić, K., Peetz, H.K., Röer, J.P., Schulze, L., Wagner, L., Wolska, J.K., Kührt, C., & Pronizius, E. (2023). We don’t know what you did last summer. On the importance of transparent reporting of reaction time data pre-processing. *Cortex*. [DOI URL]