Effects of masked prime duration in an online lexical decision task

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Abstract

Masked priming is one of the most important paradigms in the study of visual word recognition and representation.

Two to three sentences of **more detailed background**, comprehensible to scientists in related disciplines.

One sentence clearly stating the **general problem** being addressed by this particular study.

One sentence summarizing the main result (with the words "**here we show**" or their equivalent).

Two or three sentences explaining what the **main result** reveals in direct comparison to what was thought to be the case previously, or how the main result adds to previous knowledge.

One or two sentences to put the results into a more **general context**.

Two or three sentences to provide a **broader perspective**, readily comprehensible to a scientist in any discipline.

Keywords: keywords

Word count: X

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Masked priming (Forster & Davis, 1984) is one of the most important paradigms in the study of visual word recognition. Priming refers to the observation that the response to a target stimulus (e.g. responding that “DOCTOR” is a word in a lexical decision task or pronouncing the same stimulus in a naming task) is faster, more accurate, or both when it was preceded by a related stimulus (e.g. “nurse”) compared to an unrelated stimulus (e.g. “horse”). In masked priming, the prime stimulus (“nurse” or “horse”) is presented very briefly (for less than 60 ms) and is itself preceded by a mask (e.g. “#####”) which is presented fora much longer duration (typically 500 ms). This forward mask ensures that participants are usually unaware of the prime (Forster & Davis, 1984). The masked priming paradigm has been used in a large number of studies over the last decades (for a review, see e.g. Kinoshita & Lupker, 2004; Van den Bussche, Van den Noortgate, & Reynvoet, 2009), but so far, virtually all of these studies have been done in a laboratory setting, often using the DMDX software by Forster and Forster (2003). Given that, as of the time of this writing, researchers in a large part of the world are unable to perform psychology experiments in a laboratory due to the COVID-19 pandemic, with not much clarity about when laboratories will be able to reopen completely, it is an important consideration whether it may be possible to collect masked priming data remotely using online experiments. Even after the current exceptional situation, online data collection has many advantages, such as easy access to a much more diverse population than would be accessible at the typical university research laboratory, independence from laboratory space constraints, and, often, lower costs as participants only need to be compensated for their time on the experiment, not time spent commuting, waiting for the experiment to start, etc. Researchers in decision making and economics have been using online paradigms for several decades now (e.g. Birnbaum & Birnbaum, 2000; Paolacci, Chandler, & Ipeirotis, 2010), but cognitive and experimental psychology have been much slower in taking up online paradigms, often due to concerns about the validity of the results. Such concerns are not limited to cognitive studies (Aust, Diedenhofen, Ullrich, & Musch, 2013), but they are exacerbated by the reliance on precise presentation times. In masked priming, it is critical for the onset of the mask, the prime, and the target to occur at the intended times. In particular, presenting the prime for too long will counteract the effect of the mask, making the prime consciously visible to the participant. There have been attempts to address these concerns. For example, a Web version of DMDX (webDMDX) was developed which showed promising results in a trial experiment (Witzel, Cornelius, Witzel, Forster, & Forster, 2013). However, webDMDX was a self-contained Windows executable file that participants had to download and run rather than a "true" online experiment that could be run inside of a browser. A downside of this is that participants often are (and should be) understandably skeptical about downloading and running files from the Internet. Additionally, many participants may not have access to a Windows PC, or may be discouraged from participating by the extra work it takes to deploy the experiment on their computer.

Gomez, Perea, and Ratcliff (2013) performed an experiment

Methods

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.

Participants

Material

Procedure

Data analysis

We used R (Version 4.0.3; R Core Team, 2020) and the R-package *papaja* (Version 0.1.0.9942; Aust & Barth, 2020) for all our analyses.

Results

Discussion

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