Waiting for one second improves accuracy: Experimental examinations based on mouse trajectories during binary choice tasks

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Abstract:

People sometimes make judgments under their limited cognitive resources. In this study, we proposed a simple intervention "**keeping people waiting for 1 second at the beginning of tasks**", and examined its effects based on mouse trajectory analyses. As a result, participants could make many accurate judgments with less impulsivity and less mental workload. Our proposed intervention can easily enhance people's appropriate allocation of cognitive resources and more accurate judgments.

Background:

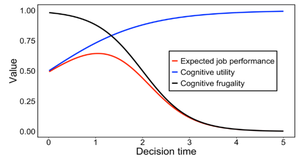
Limited cognitive resources (e.g., computational capacity, time, …)

- People often make judgments intuitively within a short time.

Resource rationality (e.g., Griffiths et al., 2015)

- People make rational and accurate judgments within their limited cognitive resources.

(Kagawa et al., 2022)



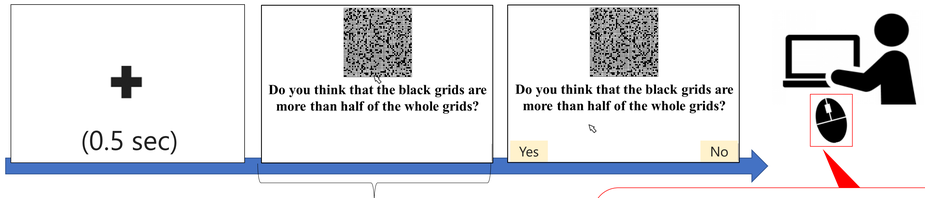
Hypotheses:

To enhance appropriate allocation of cognitive resources…

- We proposed a very simple intervention "***making people wait for 1 second at the beginning of tasks***".

Method:

1. Grid task; 3 conditions (40 trials × 9 blocks)

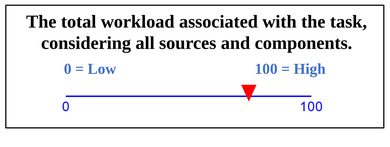


(No) : ***0-sec wait*** **(n = 39)**
1 sec : ***1-sec wait*** **(n = 40)**
2.5 sec : ***2.5-sec wait*** **(n = 41)**

- Record: **mouse trajectories** (e.g., Freeman & Ambady, 2010)

2. NASA-TLX; 1s & 2.5s conditions
(8 ques. based on Hart & Staveland, 1988)

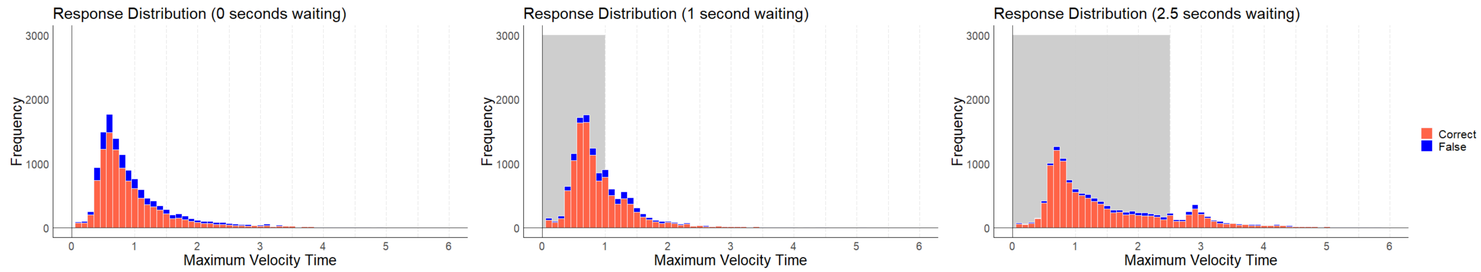
- Asking mental workload



Results & Discussion:

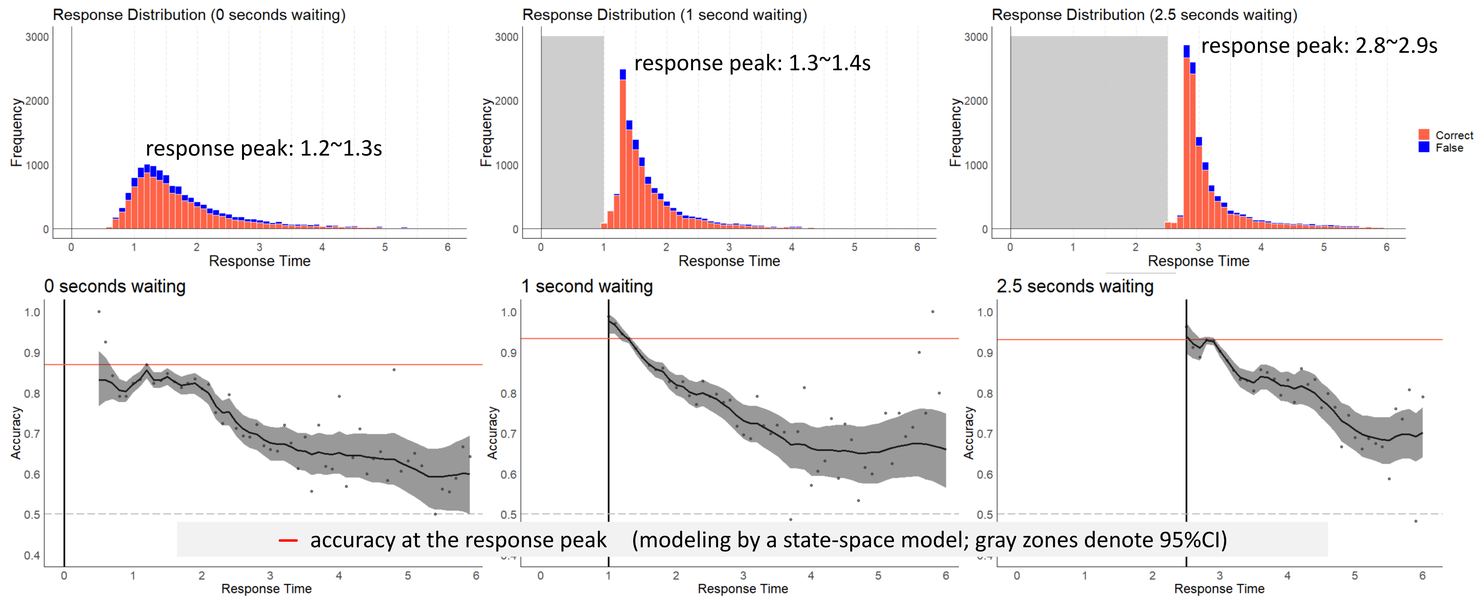
Maximum velocity time of mouse cursor (i.e., when did participants make judgments?)

- In all conditions, participants moved a mouse (i.e., judgments were made) **at the beginning**.



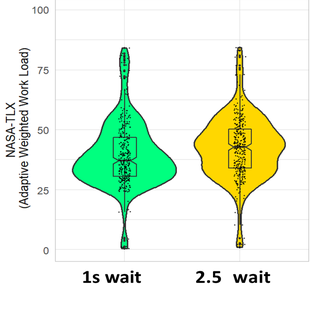
Accuracy at the response peak

- *0s wait* (.869) < ***1s wait* (.933)** ≒ *2.5s wait* (.931)



Mental workload (*Adaptive Weighted Work Load* score [Miyake, 2015])

- ***1s wait*** < 2.5 wait (p < .05; Cliff's Δ = 0.184)



Conclusion

- People often start making judgments at the beginning of tasks, but can avoid false judgments by waiting 1 second with less workload.

References: Freeman & Ambady, 2010, *Beh Res Method*; Griffiths et al., 2015, *TopiCS*; Hart & Staveland, 1988; *Adv in Psy*; Kagawa et al., 2022; arXiv; Miyake, 2015

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