**Show some sensitivity! Using motion tracking to improve unconscious measures**

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The scope of unconscious processing has been widely debated for decades. Recently, great emphasis has been made on methodological issues that might lead to overestimation of unconscious processing (e.g., by contamination from conscious processes). On the other hand, some claim that unconscious processes might actually be underestimated; for example, when measures of awareness are too strict. Here, we propose that another source of underestimation might be lack of sensitivity of measures probing the unconscious effect. A more sensitive measure might capture delicate changes in behavior that go unnoticed using existing measures (e.g., measuring reaction times for a response given using a keyboard press). Our research accordingly translated a classic paradigm for studying unconscious processing (Dehaene et al., 2001) into a motion tracking paradigm. Participants were presented with a masked word, followed by a visible target, on which they performed a semantic judgement (is it natural/artificial). They were asked to provide their response using a touch screen, and their movement trajectory was tracked throughout the trial. We found that trajectories on incongruent trials were biased towards the prime, providing evidence for unconscious processing of the masked word. This method can now be used to explore other types of unconscious processing and track their time-course (i.e., the point in time in which movement is affected by unconscious information).

**Prev versions**

**A brief introduction to the topic that you're investigating.**

**What is your paper about?**

1. When probing unconscious processing one should practice great care, the stimulus used must be just weak enough to avoid awareness, but not too weak as to avoid processing altogether. This inherent property of unconscious stimulus obstructs the bringing about of behavioral effects, which could be the reason why many interesting findings in this field aren't replicated successfully, and thus are sadly (although sometime rightfully so) discarded. Had a more sensitive measure been introduced which could capture delicate changes in behavior it could reignite the interest in previously disputed findings.
2. Unconscious processing research is under much scrutiny, in order for a stimuli to be considered unconscious it has to be weak enough to avoid awareness but not too weak to prevent processing at all. This inherent property of weakness of unconscious stimuli makes it hard for this weak stimuli to introduce behavioral effects, which could be the reason why many very interesting findings in this field fail to replicate and are sadly (although sometime rightfully so) discarded. If a more sensitive behavioral measure would be introduced it could theoretically capture the weak(replace word) influence of the unconscious stimuli and open to field to new venues of research.
3. Unconscious processing experiments are subjected to much scrutiny, partially because a significant amount of papers in this field were not replicated successfully ??? replication unconscious processing ???.

This could be due to the need for unconscious stimuli to very weak in order to avoid awareness, but not too weak to not be processed at all.

This means unconscious stimuli might have a hard time initializing measurable behavioral response, which might explain why it is not always found in replications.

It is unfortunate for interesting findings to be discarded

perhaps because the measures that are used aren't sensitive ??? look for paper on effect sizes ??? enough, so their signal to noise ratio is very low.

**Explanation of why the topic is important in your field/s.**

**Statement about what the gap is in the research.**

**Why is it important?**

~~Showing unconscious effects is a complicated task whos results are usually up for much critism and doubt. Partially because of the small effect sizes found in these researchs.~~

~~These might stem for a lack of sensiticvity in the currently used measures.~~

**Your research question/s / aim/s.**

1. Our research utilizes the sensitive nature of trajectory analysis to unravel the subtle influences of unconscious stimuli on behavior.
2. ~~Our research shows preliminary results for a new measure for unconscious processing which utilizes motion tracking~~ ??? Find papers that favor traj analysis over other behavioral measures ???

**An indication of your research methods and approach.**

**How did you do it?**

We introduced subjects to a semantic priming task while recording their answers using a motion tracking system.

**Your key message.**

**A summary of your key findings.**

**What did you find?**

Trajectories on incongruent trials were biased towards the prime.

In an ongoing iteration of the experiment with a large sample size we hope to find a greater effect size for trajectory analysis over a simple keyboard response paradigm.

**An explanation of why your findings and key message contribute to the field/s.**

**Why are your findings important?**

When probing unconscious processing one should practice great care, the stimulus used must be just weak enough to avoid awareness, but not too weak as to avoid processing altogether. This inherent property of unconscious stimulus obstructs the bringing about of behavioral effects, which could be the reason why many interesting findings in this field aren't replicated successfully, and thus are sadly (although sometime rightfully so) discarded. Had a more sensitive measure been introduced which could capture delicate changes in behavior it could reignite the interest in previously disputed findings.

Our research utilizes the sensitive nature of trajectory analysis to unravel the subtle influences of unconscious stimuli on behavior.

In a variation of Dehaene et. al (2001) paradigm we introduced subjects to a semantic priming task while recording their answers using a motion tracking system and found that trajectories on incongruent trials were biased towards the prime.

In an ongoing large sample size iteration of the experiment, we hope to find a greater effect size for trajectory analysis than the one found by Dehaene et al. while using a keyboard response paradigm.