

# The effects of ego depletion on belief bias

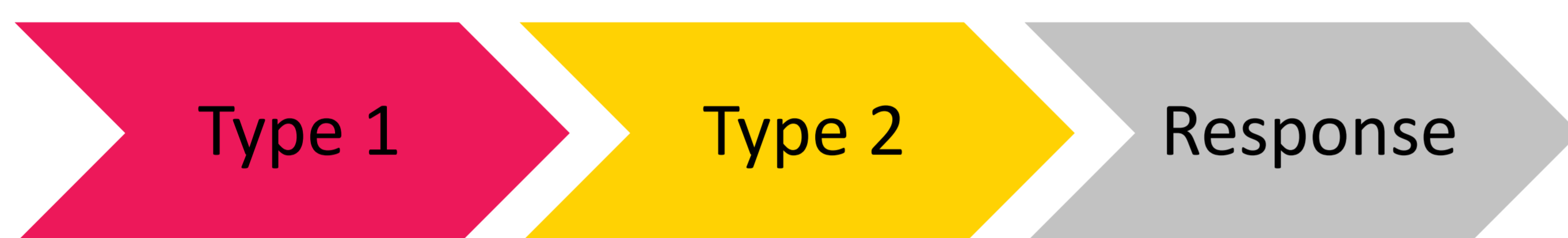
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## 1. Introduction

In the psychological literature logical reasoning is associated with System 2 processes (characterized as slow, controlled, limited in capacity, and effortful) whereas belief based judgments are frequently linked to System 1 processes (described as fast, automatic, high in capacity, and effortless). This dichotomization of cognitive processes forms the basis for a variety of dual process models in cognitive science (i.e., Kahneman, 2002). Here we focus on the default-interventionist account (DI account; Evans, 2007) which postulate that these processes operate in a sequential fashion.



## 2. Experiment

We investigated the effects of ego depletion on hypothetical syllogistic reasoning by manipulating self regulatory resources between groups. Participants were subsequently instructed to evaluate conclusions of syllogisms either on the basis of their semantic believability or logical validity.

We hypothesized that belief based judgments would be faster and more accurate relative to logic judgments and that ego-depletion would interfere with the latter but not with the former. This hypothesis was motivated by the strength model of self-control (Baumeister et al., 2007) and the default-interventionist account of reasoning (Evans, 2007).

## 3. Results

Our experiment did not support the predictions. Statistical analysis showed that:

- logic based judgments were faster compared to belief based judgments (Figure 1).
- ego depleted participants performed more accurate relative to controls (Figure 2).

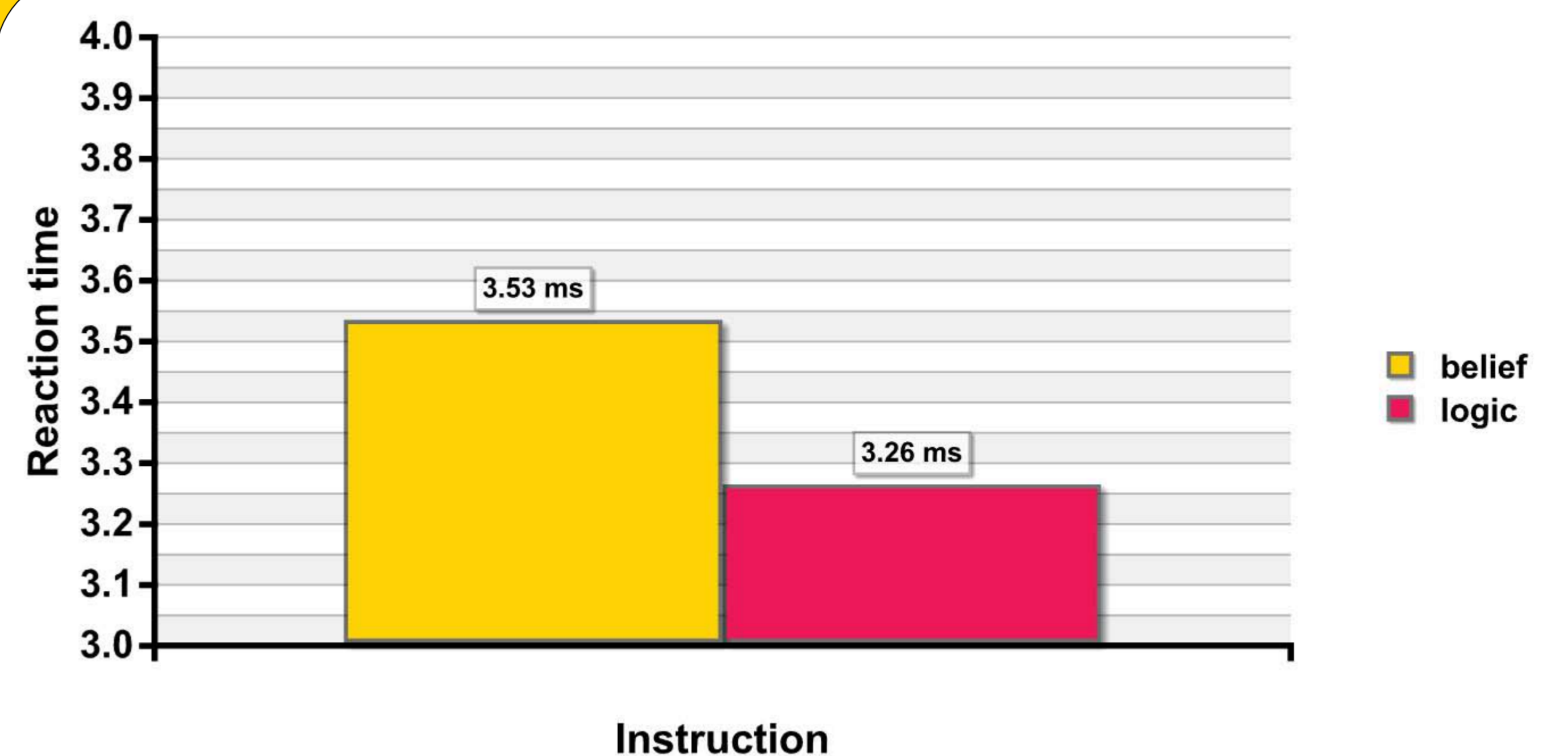


Figure 1. Reaction time as a function of instruction.

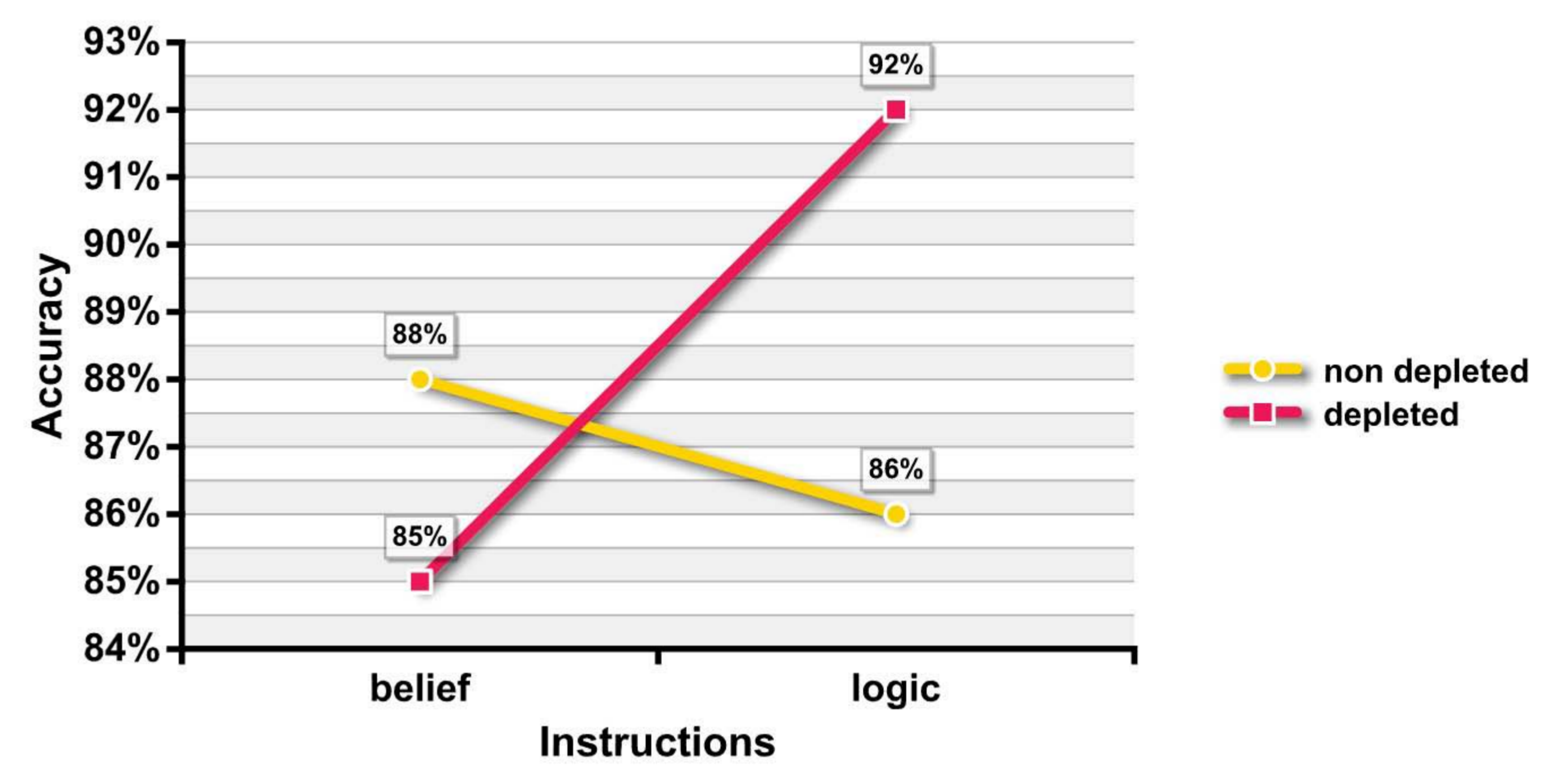


Figure 2. Accuracy as a function of ego depletion condition and problem type.

## 4. Conclusions

The statistical results provide a replication of the observations made by Handley et al. (2011) and implicate that logical reasoning precedes belief based reasoning, which stands in direct contrast with the predictions derived from the DI model (Evans, 2007).

In our view the dichotomous DI account draws an oversimplified picture which leaves no room for any gray shadings between Type 1 and Type 2 processes. It seem more plausible that the transitions between Type 1 and Type 2 processes are gradual and that these processes constantly interact and never reside in absolute stasis.

## 5. References

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- Evans, J. S. B. T. (2007). On the resolution of conflict in dual process theories of reasoning. *Thinking & Reasoning*, 13(4), 321-339.
- Kahneman, D. (2002). Nobel Prize lecture by Daniel Kahneman. [Video file]. Available from: <http://nobelprize.org/mediaplayer/index.php?id=531>
- Handley, S. J., Newstead, S. E., & Trippas, D. (2011). Logic, beliefs, and instruction: a test of the default interventionist account of belief bias. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 37(1), 28-43.