

# Judgment of Recency with Order and Time

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## Introduction:

As we try to build better artificial intelligence it is important to know how the human brain processes information. The primary purpose of this specific research project is to investigate whether recency judgments are better explained by temporal or ordinal distance, we modified existing judgment of recency (JOR) implementation to include time-varying interstimulus intervals. This will help us better understand how the working memory processes information and whether or not it primarily uses time or order to determine recency.

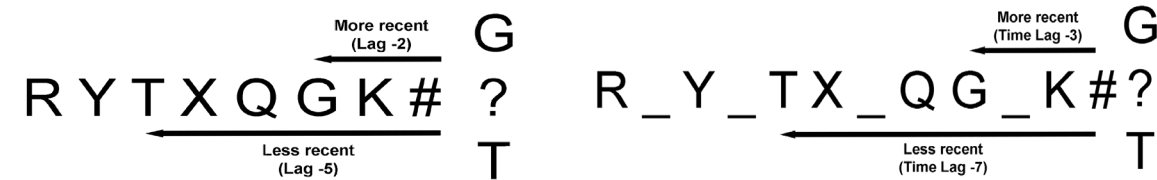


## Previous Work:

Other experiments have already been done focusing on judgment of recency as well as judgment of imminence. These experiments were created with the javascript library, jsPsych, where the subject is shown a series of letters and the subject needs to decide which one was most recent. These experiments showed that the subject relied mostly on the most recent stimulus.

### Without Spaces

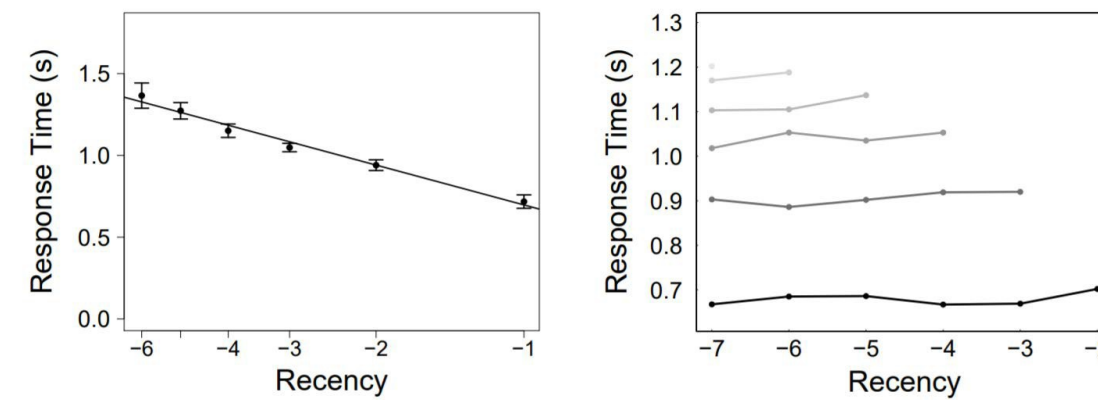
### With Spaces



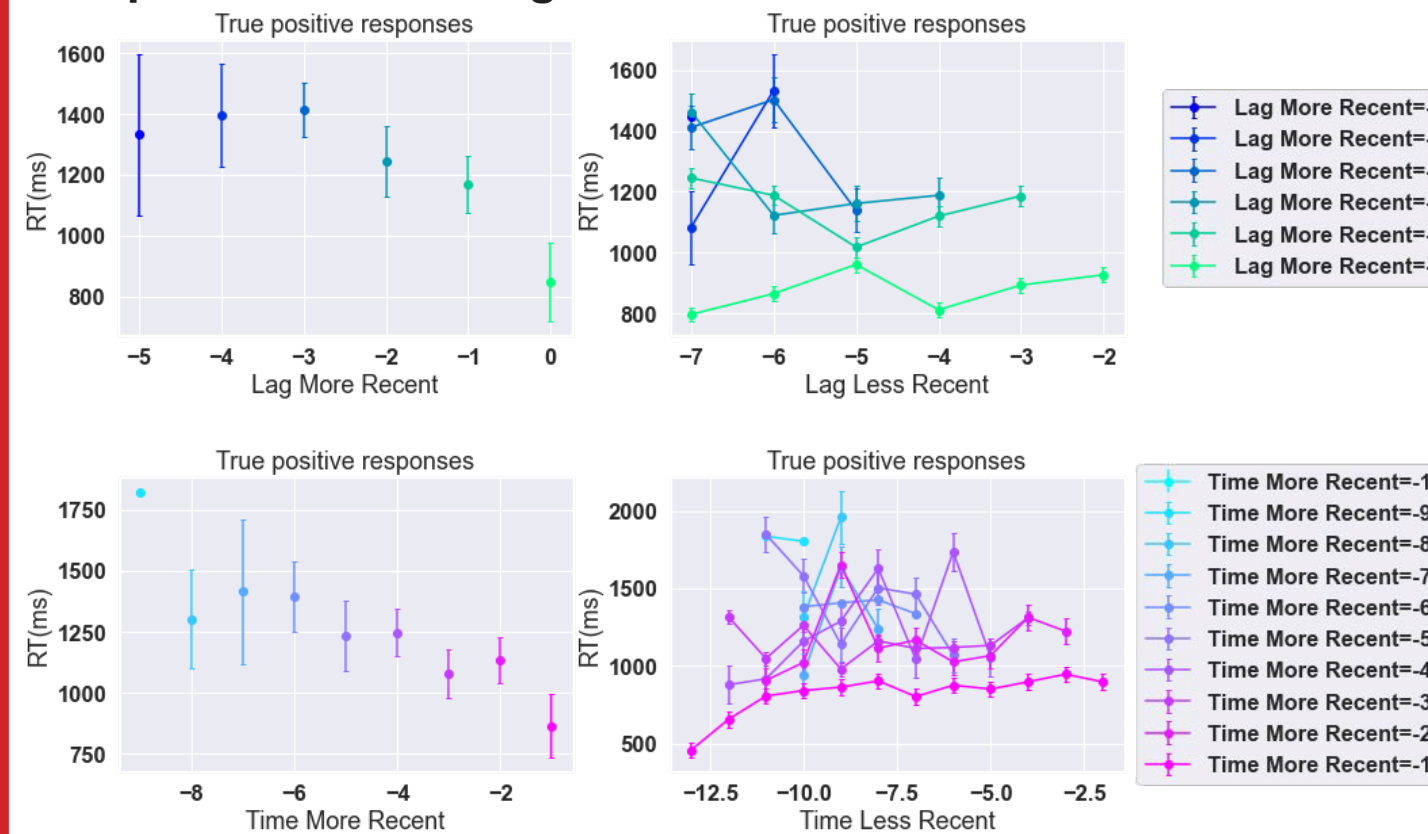
## Methods:

Previous JsPsych experiments have been modified by adding spaces in between the stimuli that vary the time between stimuli. During these experiments, there was a 40% chance that a space would be added between letters. Each letter is shown for 182 milliseconds and the number of letters in the sequence varies between nine, eleven, and thirteen. The letters used to prompt the participant are selected only from the final seven letters in the sequence.

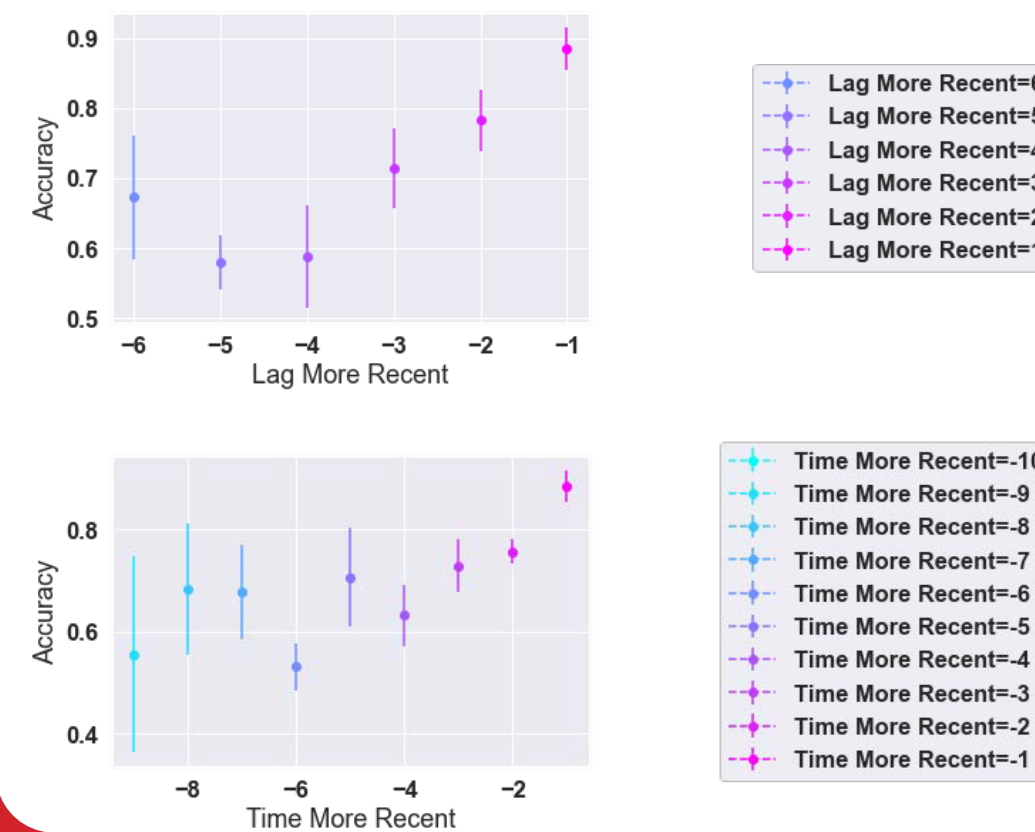
## Expected Response Time vs Lag:



## Response Time vs Lag:



## Accuracy vs Lag:



## Insights:

From this data, we cannot make any firm conclusions because the participant group size is too small, but some trends have been noticed. Because the graphs that relate response time to lag appear monotonic and the graphs that relate response time to time lag appear to be zig-zagging and non-monotonic it appears that the participants are utilizing order as opposed to time in order to make a recency judgment. We also noticed that when the lag increases, after a certain point the response time decreases. We believe this to be caused by the idea that people will remember the beginning of the series and the end of the series better than they remember the middle. This was supposed to be remediated by varying the lengths of the series and only using the last seven letters shown. More data will need to be collected in order to make any conclusions.

## Future Work:

Because we did not have a large number of participants in the future we'd like to expand out. It is also necessary to alter the experiment to more evenly distribute time-spaces into the stimulus series. This will allow for better statistical analysis. Lastly, once the experiment is altered and more data is gathered a more in-depth analysis will be done to better understand the statistics that we have started to see so far.

We thank Sahaj Maini Singh for sharing jsPsych implementation of JOR task and Zahra Esfahani for sharing the code for RT and accuracy analysis in JOR.

## References:

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