

# Methods 3: Multilevel Statistical Modeling and Machine Learning

## Class 03:

*What to do when the response variable is not continuous?*

September 19, 2024

# Troubleshooting - conda environment

## Goal:

Have a conda environment,  
which can be  
accessed  
through RStudio

## Windows

Add your name here:  
if you have *not*  
succeeded in the first  
step:

Name 1  
Name 2

## MacOS

Add your name here:  
if you have *not*  
succeeded in the first  
step:

Name 1  
Name 2



Reconnecting...

# Assignment 2 – parts 1 and 2

Will count as one assignment for the purposes of  
the exam

If you cannot knit a pdf, try html instead  
(you can make it a pdf afterwards)

```
---  
title: "Untitled"  
date: "2024-09-19"  
output: html_document  
---
```

```
---  
title: "Untitled"  
date: "2024-09-19"  
output: pdf_document  
---
```

# assignment\_2\_part\_1, Methods 3, 2024

2024-09-19

REMEMBER: In your portfolio, make sure to include code that can reproduce the answers requested in the exercises below (**MAKE A KNITTED VERSION**). If it does not KNIT, it cannot be part of your portfolio

## Exercises and objectives

The objectives of the exercises of this assignment are:

- A) Download and organise the data and model
- B) Fit multilevel models for response times
- C) Fit multilevel models for binomial data
- D) Fit multilevel models for count data

# Introduction to experiment




Consciousness and Cognition




Volume 71, May 2019, Pages 59-69



## Visual expectations change subjective experience without changing performance

Lau Møller Andersen <sup>a b</sup>  , Morten Overgaard <sup>b</sup>, Frank Tong <sup>c</sup>

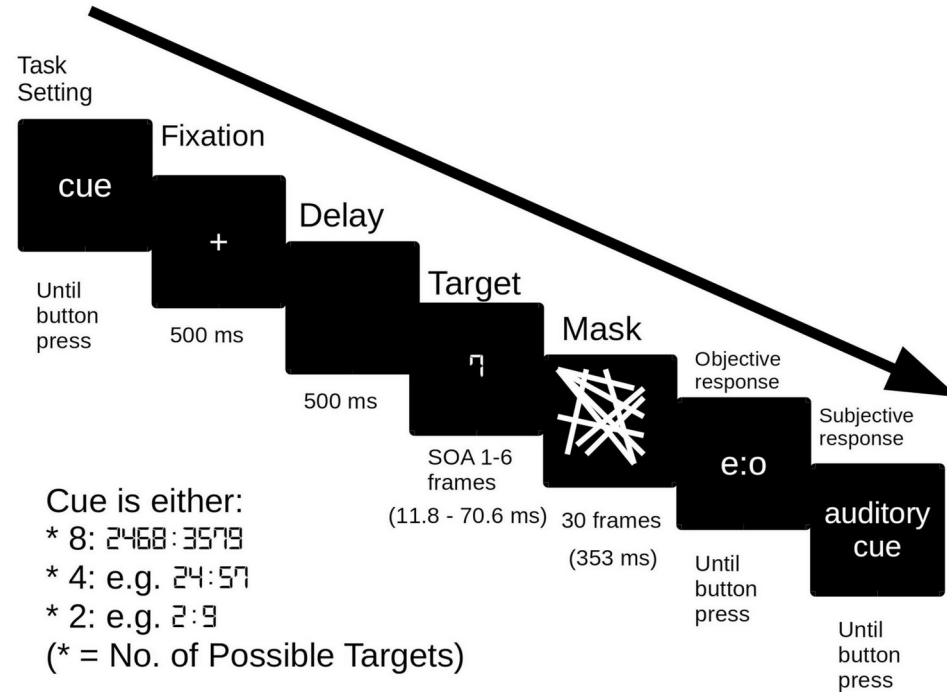
Show more 

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<https://doi.org/10.1016/j.concog.2019.03.007> 

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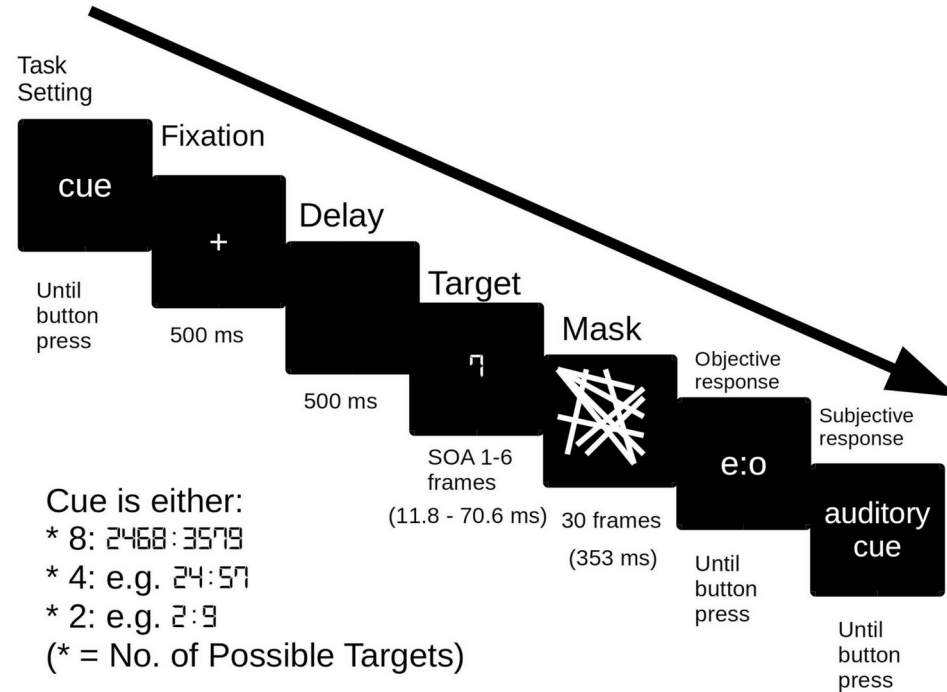
# Introduction to experiment



Andersen LM, Overgaard M, Tong F (2019) Visual expectations change subjective experience without changing performance. *Consciousness and Cognition* 71:59–69.  
<https://doi.org/10.1016/j.concog.2019.03.007>

# Introduction to experiment

We are looking at experiment 2, where Stimulus Onset Asynchrony was always 3 frames, i.e. 35.3 ms



Andersen LM, Overgaard M, Tong F (2019) Visual expectations change subjective experience without changing performance. *Consciousness and Cognition* 71:59–69. <https://doi.org/10.1016/j.concog.2019.03.007>



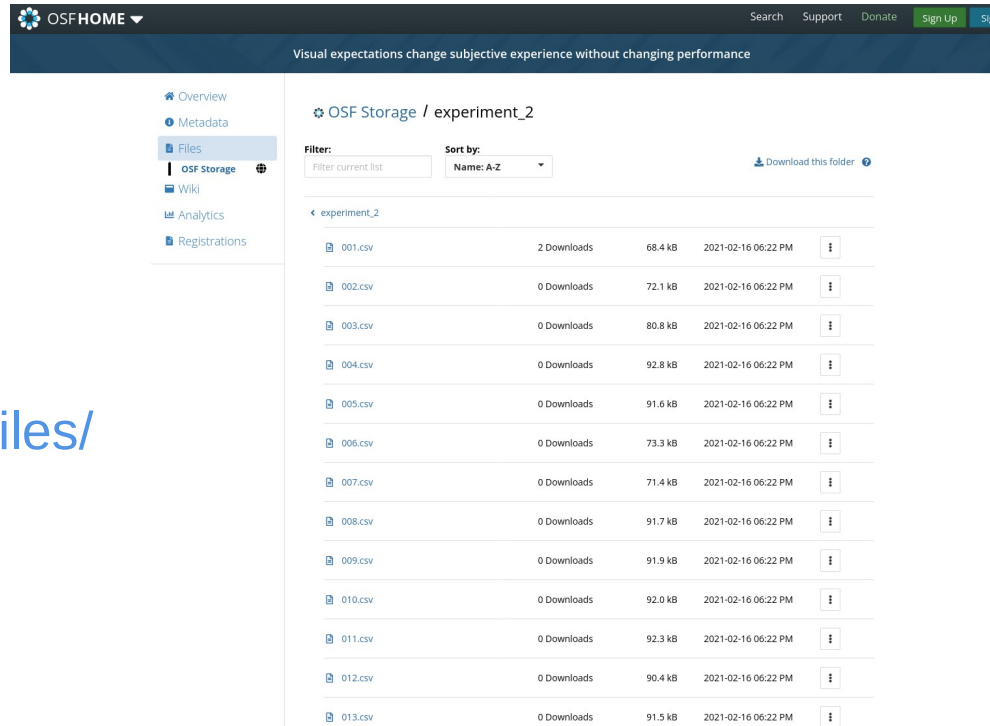
# Perceptual Awareness Scale

Table 2. A generalisation of all subjects' description of each category based on the interview following the experiments.

| PAS | Category                | Description  |
|-----|-------------------------|--|
| 1   | No experience           | No impression of the stimulus. All answers are seen as mere guesses  |
| 2   | Brief glimpse           | A feeling that something has been shown. Not characterised by any content, and this cannot be specified any further  |
| 3   | Almost clear experience | Ambiguous experience of the stimulus. Some stimulus aspects are experienced more vividly than others. A feeling of almost being certain about one's answer |
| 4   | Clear experience        | Non-ambiguous experience of the stimulus. No doubt in one's answer   |

Ramsøy TZ, Overgaard M (2004) Introspection and subliminal perception. *Phenomenology and the Cognitive Sciences* 3:1–23.  
<https://doi.org/10.1023/B:PHEN.0000041900.30172.e8>

# Data – Center for Open Science



The screenshot shows the OSFHOME website. The top navigation bar includes the OSFHOME logo, a search bar, and links for Support, Donate, Sign Up, and Sign In. A banner below the navigation bar reads "Visual expectations change subjective experience without changing performance". The left sidebar contains a menu with links to Overview, Metadata, Files (selected), OSF Storage, Wiki, Analytics, and Registrations. The main content area displays the "OSF Storage / experiment\_2" page. It features a "Filter:" dropdown set to "Filter current list" and a "Sort by:" dropdown set to "Name: A-Z". A "Download this folder" button is visible. Below these controls is a table listing 13 CSV files, each with a download icon, a download count, file size, and timestamp.

| File Name | Downloads   | Size    | Timestamp           |
|-----------|-------------|---------|---------------------|
| 001.csv   | 2 Downloads | 68.4 kB | 2021-02-16 06:22 PM |
| 002.csv   | 0 Downloads | 72.1 kB | 2021-02-16 06:22 PM |
| 003.csv   | 0 Downloads | 80.8 kB | 2021-02-16 06:22 PM |
| 004.csv   | 0 Downloads | 92.8 kB | 2021-02-16 06:22 PM |
| 005.csv   | 0 Downloads | 91.6 kB | 2021-02-16 06:22 PM |
| 006.csv   | 0 Downloads | 73.3 kB | 2021-02-16 06:22 PM |
| 007.csv   | 0 Downloads | 71.4 kB | 2021-02-16 06:22 PM |
| 008.csv   | 0 Downloads | 91.7 kB | 2021-02-16 06:22 PM |
| 009.csv   | 0 Downloads | 91.9 kB | 2021-02-16 06:22 PM |
| 010.csv   | 0 Downloads | 92.0 kB | 2021-02-16 06:22 PM |
| 011.csv   | 0 Downloads | 92.3 kB | 2021-02-16 06:22 PM |
| 012.csv   | 0 Downloads | 90.4 kB | 2021-02-16 06:22 PM |
| 013.csv   | 0 Downloads | 91.5 kB | 2021-02-16 06:22 PM |

<https://osf.io/ecxsj/files/>

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# Data contains

- Response times
- Accuracy
- And counts of Perceptual Awareness Scale Ratings

# Model comparisons

- In part 1, you are asked to do model comparisons – on purpose, I ask you to do this before you have had the lecture on quantitative comparisons
  - Model comparisons can also be done without appealing to statistical significance
- If you prefer, you may come back to part 1 in your exam and use the quantitative methods you will learn about performing model comparisons, but it is *not* a requirement

# Now let's get to it!