#### Preregistration for Yanny/Laurel Demo Experiment

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#### 1) Data collection. Have any data been collected for this study already?

We have collected data from seven (7) participants. However, we have not performed any data analysis at the time of writing this Preregistration. We looked at the file format of the data (.csv) for one (1) participant to ensure our program was saving information correctly.

#### 2) Hypothesis. What's the main question being asked or hypothesis being tested in this study?

In this experiment, we ask participants to listen to audio stimuli and report if they heard “Yanny” or “Laurel.”

Yanny/Laurel 2AFC Responses

We ask, why do participants respond “Yanny” or “Laurel” to a given (ambiguous) audio stimulus. We hypothesize that people’s perception of “Yanny” vs. “Laurel” relies on the frequency content of the audio stimulus. Thus, we predict that we can manipulate people’s perception (e.g. the proportion of trials on which they respond “Yanny”) by changing the dB ratio of the upper vs. lower frequencies in the audio stimulus. Specifically, we predict that when the lower frequencies are [more present] in the audio stimulus, participants’ perception will be biased towards “Laurel,” and vice versa, when the higher frequencies are [more present], perception will be biased towards “Yanny.”

Reaction Time

We hypothesize that the dB ratio manipulation affects the ambiguity of the stimulus. Since reaction times may index certainty, we predict that RTs will be comparatively longer for auditory tokens that are more similar to the original audio, than for auditory tokens with more extreme high/low dB ratios.

#### 3) Dependent variable. Describe the key dependent variable(s) specifying how they will be measured.

The main dependent variable is the participant response to the two-alternative-forced-choice task (2AFC task), asking whether they heard the stimulus as “Yanny” or “Laurel.” Analyses will be conducted on the proportion of trials where participants head “Yanny.” We will also analyze reaction times (RT) for each response.

We are also interested in looking at the effect of age, sex, and years of musical experience on the proportion of “Yanny” responses.

#### 4) Conditions. How many and which conditions will participants be assigned to?

All participants are in the same condition group. All participants hear the original audio token (from the Yanny/Laurel internet meme) and 10 filtered versions in which the higher or lower frequencies have been attenuated.

All participants perform 3 blocks: in each block, the 11 audio tokens are presented twice in pseudo-random order (all 11 are heard in random order, then all 11 are heard again in another random order). In total, each participant hears and responds to each token a total of 6 times.

#### 5) Analyses. Specify exactly which analyses you will conduct to examine the main question/hypothesis.

To determine whether the dB ratio manipulation significantly affects the proportion of “Yanny” responses, we will perform a logistic regression using proportion “Yanny” responses as outcome variable and dB ratio as predictor. Our model will be specified by a binomial distribution with a logit link function. We will also run a model using dB ratio as well as sex, age, and years of musical experience as predictors to determine the effect of these variables on proportion “Yanny” responses.

To determine whether RTs are modulated by dB ratio (for the purposes of our study, an index of stimulus ambiguity), we will perform a polynomial linear regression with RTs as outcome variable and dB ratio as predictor.

#### 6) Outliers and Exclusions. Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

We will exclude particularly slow and particularly fast responses, defined as median +- 3 \* the median absolute deviation (MAD). However if this procedure eliminates more than 5% of observations, we will opt for a factor to multiply the MAD by, that allows for retention of at least 95% of the data.

#### 7) Sample Size. How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

We restricted our data collection to the class of EXPRA Group 6, plus the instructor and the instructor’s friend. Our sample size is therefore 7 participants.

#### 8) Other. Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

None.

#### 9) Name. Give a title for this AsPredicted pre-registration Suggestion: use the name of the project, followed by study description.

#### Finally. For record keeping purposes, please tell us the type of study you are pre-registering.

* ~~Class project or assignment~~
* ~~Experiment~~
* ~~Survey~~
* ~~Observational/archival study~~
* Other: DEMONSTRATION EXPERIMENT