The purpose of these plots is to assess whether or not the male and female utterances of the same consonant vowel (CV) can be treated as unique (i.e., the subject responds to the two differently) or as two representations of perceptually identical sounds. In other words: “we really want to know when a subject is sensitive to the utterance, or just sensitive to the consonant, independent of the utterance.” One way to examine this would be to look at the error or entropy as a function of SNR and see whether or not the utterances show significant differences. The problem with this approach is that the two utterances could have similar error or entropy as a function of SNR, but then have completely different confusions, meaning that one would falsely assume that the responses of the listener are independent of the utterance. In order to solve this problem, we need to look at the specific confusions as a function of SNR, for each listener. Looking at the confusions of a single utterance, over all SNR’s, for all listeners will not only help us see whether or not a single listener is sensitive to the utterances, but will also allow us to see if the confusions are consistent across listeners (i.e., which listeners make similar errors). The data examined is from HI Experiment 2.

Each consonant is examined in a separate Figure, with the female utterance displayed in the top stacked confusion plots and the male utterance confusions shown in the bottom plot. The results for all listeners and all SNR’s are shown in each plot, and the key for the colors is consistent across all Figures.

1 /ba/

Figure 1 displays the results for /ba/. We see in Figure 1 that the two utterances each have unique, consistent confusions across listeners; the female /ba/ is most commonly confused with /da/ (48% of the total confusions), followed by confusions with /va/ (22%) and /ga/ (14%). The male utterance is most commonly confused with /va/ (64% of total confusions), followed by confusions with /fa/ (17%). We can see from the consistency of the confusions across listeners that the two utterances do not behave similarly under masking noise for any of the listeners, thus, for /ba/, we can say across the board that the listeners are sensitive to the utterances. The only listener that this does not hold for is 44R, which had no errors with /ba/.

In addition, Figure 1 shows the error and entropy plots for the two utterances, with the red lines showing the female utterance results and the blue lines showing the male utterance results. We can find examples where the error, entropy, or both are very similar, but when we look at the confusions, we can see that the perception of the subject for the two utterances is quite different. Examples of this would be subjects 01R (error and entropy), 32L (error only), 36L (error and entropy at high SNR), and 36R (error only).
Figure 1: Confusions, error and entropy for /ba/

(a) All Stacked Confusions /ba/

(b) Error (top) and Entropy (bottom) for /ba/
Figure 2: All confusions for /da/

Figure 3: All confusions for /fa/
Figure 4: All confusions for /ga/

Figure 5: All confusions for /ka/
Figure 6: All confusions for /ma/

Figure 7: All confusions for /na/
Figure 8: All confusions for /pa/

Figure 9: All confusions for /sa/
Figure 10: All confusions for /xsa/

Figure 11: All confusions for /ta/
Figure 12: All confusions for /va/

Figure 13: All confusions for /xza/
Figure 14: All confusions for /za/