

The impact of task instructions on prediction in older adults with and without hearing loss

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Semantic prediction is the preactivation of semantic information before it is directly encountered. While evidence of semantic prediction in younger adults is relatively robust, evidence for prediction in older adults (>50 years old) is less consistent^[1]. This may be due to age-related changes in our sensory and cognitive systems which directly impact language processing. Recently, it has been found that older adults with hearing loss (PwHL) are delayed in making predictions relative to older adults with normal hearing (PwNH)^[2]. The authors argue that hearing loss results in more effortful listening and greater reliance on cognitive resources to extract meaning relative to PwNH^[3], leaving fewer resources for prediction. Interestingly, recent evidence suggests speakers can strategically adjust predictions based on top-down strategies, such as task instructions. For example, using the visual world paradigm (VWP), Korean L1 and L2 listeners have been shown to use honorific information more quickly to anticipate the target when instructed to actively predict relative to when instructed to comprehend sentences^[4,5]. Given that PwHL are delayed in making predictions, in this study we test whether actively encouraging prediction through explicit instructions can offset these delays.

33 PwNH ($M_{age}=73.25$) and 28 PwHL ($M_{age}=66.33$) participated in a VWP study with semantically predictable and unpredictable sentences (see Table 1). To investigate prediction, we compared looks to the target (*suit*) vs. a distractor (*tree*) while listening to *The tailor trimmed the suit*. The experiment featured two types of instructions: participants were either instructed to listen for comprehension (comprehend) or were explicitly instructed to predict the final word in the sentence (predict). Using divergence point analysis, we found that the PwNH looked to the target earlier in the predict relative to comprehend condition (-349ms [CI:-600,-100]). Timing in PwHL did not differ between instruction type (9ms [CI:-100,250]). See Figure 1.

These findings indicate that while PwHL do predict, they may not have the flexibility or the cognitive capacity to modulate their processing strategy. Interestingly, PwNH do have the flexibility to modulate their processing strategy with prediction occurring approximately 350ms earlier when explicitly instructed to predict. While previous research saw improvement with explicit instructions, this improvement was markedly less than in the current study. This may reflect older adults increased linguistic experience, which enables them to engage in prediction more quickly and more flexibly.

References

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Table & Figure

Table 1: Example stimuli

Condition	Example sentence	Corresponding visual array ^[6]
Predictable	The tailor trimmed the <u>suit</u> .	
Unpredictable	The guardian sells the <u>suit</u> .	

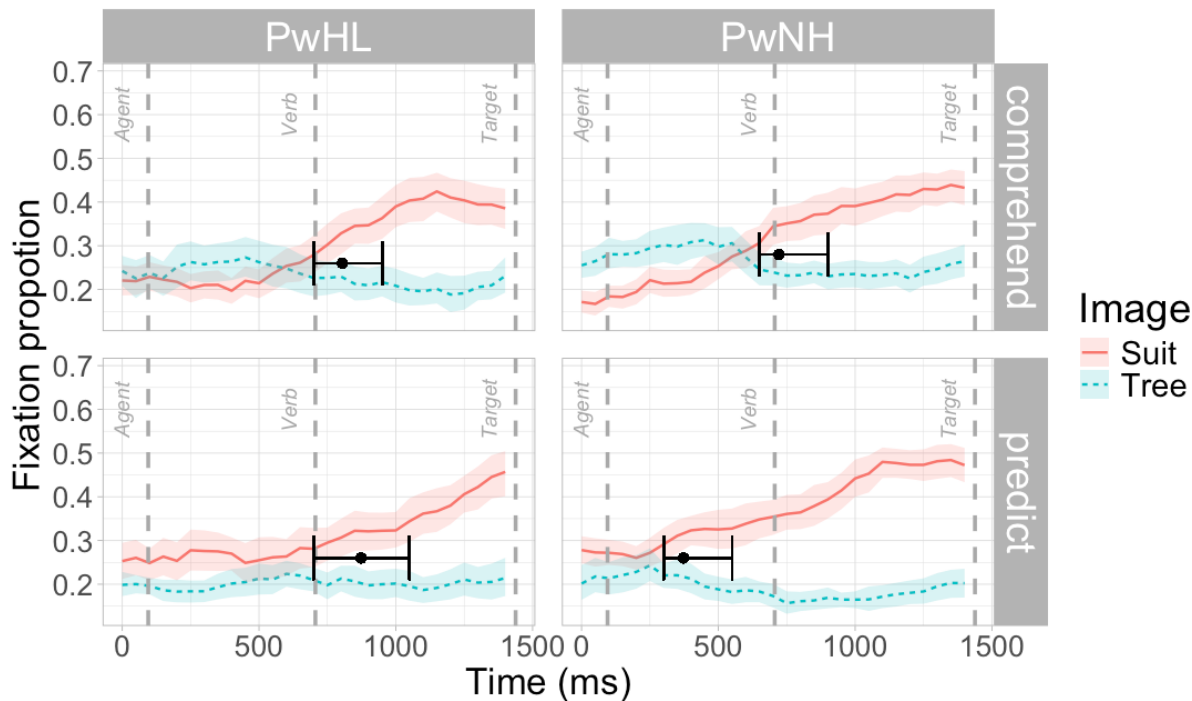


Figure 1. Divergence point and 95% confidence intervals superimposed on the fixation proportion of looks to the predictable items across instruction type and participant group.