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An Investigation into the Processing Mechanisms Guiding Phonemic Restoration

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Phonemic restoration (PhR) effects have been well documented since Warren's 1970 research¹ and much work has been done to examine the manners in which properties of a phoneme may be altered without preventing the occurrence of phonemic restoration. However, little work has been done on a broad level to identify the demographic characteristics of participants that may influence PhR, though Warren long ago raised the specific question of the role(s) played by participant's age.

This research conducted a series of online experiments in which participants listened to various incomplete speech segments and marked the spellings which they believed most matched what they heard. Stimuli and answer choices were constructed to investigate PhR effects with real word, pseudoword, and phonotactic violator stimuli and how participants' answer choices varied with changes in the excised phoneme's word position and manner of articulation, as well as the relative frequency of stimulus and answer choice words. Research primarily sought to ascertain the effects on phonemic restoration of participant age, gender, education, L2 experience, formal linguistic training and word confidence level.

The results of logistical regression analysis show that the stimulus word type and both the manner of articulation and word position of the missing phoneme affect how the missing phoneme is restored. Contrary to Warren's original finding, age itself does not play a statistically significant role in how missing phonemes are restored, but the education level of test subjects does appear to be a powerful determinant in PhR. Analysis also hints that significant L2 experience may inhibit PhR effects. The primary results of this study suggest further that top-down processing is the dominant mechanism in PhR effects, and that education may condition its prevalence over other available processing mechanisms.

As the project neared completion after nearly a year of work, the authors could see that the results were worth sharing with the linguistic community. Unfortunately, the appropriate venues were either too far in the future and conflicted with post-graduation plans, or were in other countries and thus prohibitively expensive for the department. The authors applied for an ORCA grant to present the research in Europe. Abstracts were submitted to three international conferences after receiving the ORCA grant, and happily the paper was accepted at the conference of choice.

On June 25th, 2007, the primary researcher presented the results of this research in Newcastle, England, at the 2nd Newcastle Postgraduate Conference in Theoretical and Applied Linguistics.

¹ Warren, Richard M. & Roslyn P. Warren. 1970. Auditory Illusions and Confusions. *Scientific American* 223.6, 30-36.

The conference primarily hosted graduate students in linguistics from around the world. The author's presentation on phonemic restoration was well-attended and many insightful questions were asked in the Q&A session following the presentation. It can be hoped that as a result of presenting research results at this venue, the rising generation of linguistics researchers will be aware of these surprising findings and incorporate them into their own thought and research, but may also be prompted to continue many unanswered questions raised by this study. The ORCA funds made this presentation possible, covering nearly all of the plane and hotel costs for the trip.

This research was written in full as the primary author's undergraduate thesis and published in 2007 by Brigham Young University under the title, An Investigation into the Perceptual Processes Guiding Phonemic Restoration. A copy is available at the Harold B. Lee library for checkout.



Figure 1 – Steven Pearson following his presentation at the 2nd Newcastle Postgraduate Conference in Theoretical and Applied Linguistics.