



Training and Generalization Effects of Verb Tense Training Using Irregular Verbs in Agrammatic Aphasia

Yasmeen Faroqi-Shah

EasyChair preprints are intended for rapid dissemination of research results and are integrated with the rest of EasyChair.

September 13, 2021

Training and generalization effects of verb tense training using irregular verbs in agrammatic aphasia

Yasmeen Faroqi-Shah*

Department of Hearing and Speech Sciences, University of Maryland, College Park, Maryland, USA

*corresponding author: yfshah@umd.edu

Introduction

Errors in the production of verb tense are a hallmark feature of agrammatic language production in aphasia (Bastiaanse et al., 2011; Friedmann & Grodzinsky, 1997). In languages that have both regular and irregular conjugations for verb tense, both forms are equally impaired (Faroqi-Shah, 2007). Intervention studies for verb tense, although limited, have shown that people with agrammatic aphasia are responsive to verb tense training (Dashti et al., 2018; Faroqi-Shah et al., 2008, 2013; Links et al., 2010). Moreover, tense training with irregular verbs as stimuli (e.g., *sing-sang*, *drink-drank*) generalizes to improved production of regular past tense (e.g., *walk-walked*, *push-pushed*) without explicit training of regular past tense formation rule. However, generalization to untrained irregulars is limited. Specifically, in two studies that conducted morphosemantic training of verb tense using irregular verbs as stimuli, production accuracy of untrained regular past improved by 84%, while the production accuracy of untrained irregular past verbs improved only by 55% (N=4; Faroqi-Shah, 2008, 2013).

Irregular verbs in English fall under different paradigms, which include: vowel-change (e.g., *sing-sang*), vowel-change + consonant addition (e.g., *bring-brought*), and no-change (e.g., *hit-hit*). Given that the prior studies to conduct irregular past tense training used verbs from a single paradigm (Faroqi-Shah, 2008; 2013), it remains to be investigated if using verbs from different irregular paradigms would enable better generalization to untrained irregular past verbs. This study sought to examine: 1) training and generalization outcomes for irregular past tense production when training stimuli consist of irregular verbs from different paradigms; 2) generalization to untrained tenses (present and future tense) following past tense training.

Methods

Six individuals (4M, 2F) with agrammatic language production and verb tense deficit following a single left hemisphere stroke participated in the study (Age M(SD) = 51.5(23.2) years, time post-stroke M(SD)=2.3 (1.3) years). Training followed morphosemantic treatment procedures (Faroqi-Shah, 2008) and utilized a single-subject design with three baseline sessions and 18 hours of intervention. The training stimuli included 20 irregular verbs, 10 each of vowel-change and vowel-change + consonant addition verbs. The outcome variable was accuracy of verb tense production in sentences for a picture description task for: trained irregular, untrained irregular (N=20), and untrained regular (N=20) verbs across future, past, and present tenses.

Results

The pre- and post- treatment outcomes (Figure 1) show a significant improvement in the production of trained irregular past (68.6%), untrained irregular past (43%), and untrained regular past (63.3%) tenses (Wilcoxon signed-ranks test, one-tailed $p < .05$). There was no improvement in present and future tense accuracy (29%, $p > .05$).

Conclusions

Using a mix of irregular verbs from different paradigms did not enhance generalization outcomes for untrained irregular past tense (55% in past studies vs 43% in the current study) supporting the nonproductivity of irregular verb paradigms (Leminen et al., 2019). Training past tense did not generalize to present and future tenses. Thus, this study highlights the importance of specifically targeting two components of tense training in agrammatic aphasia as these do not automatically generalize: individual irregular verbs and each tense.

References

- Bastiaanse, R., Bamyaci, E., Hsu, C.-J., Lee, J., Duman, T. Y., & Thompson, C. K. (2011). Time reference in agrammatic aphasia: A cross-linguistic study. *Journal of Neurolinguistics, 24*(6), 652-673.
- Dashti, F., Asadi, M., & Yadegari, F. (2018). The Effect of Morphosemantic Treatment on Verb-Tense Inflection in Persian-Speaking Patients with Agrammatism: A Case Report. *Middle East Journal of Rehabilitation and Health Sciences, 5*(4).
- Faroqi-Shah, Y. (2007). Are regular and irregular verbs dissociated in non-fluent aphasia?: A meta-analysis. *Brain Research Bulletin, 74*(1-3), 1-13.
- Faroqi-Shah, Y. (2008). A comparison of two theoretically driven treatments for verb inflection deficits in aphasia. *Neuropsychologia, 46*(13), 3088-3100.
- Faroqi-Shah, Y. (2013). Selective treatment of regular versus irregular verbs in agrammatic aphasia: Efficacy data. *Aphasiology, 27*(6), 678-705.
- Friedmann, N., & Grodzinsky, Y. (1997). Tense and agreement in agrammatic production: pruning the syntactic tree. *Brain & Language, 56*(3), 397-425.
- Leminen, A., Smolka, E., Duñabeitia, J. A., & Pliatsikas, C. (2019). Morphological processing in the brain: The good (inflection), the bad (derivation) and the ugly (compounding). *Cortex, 116*, 4-44.
- Links, P., Hurkmans, J., & Bastiaanse, R. (2010). Training verb and sentence production in agrammatic Broca's aphasia. *Aphasiology, 24*(11), 1303-1325.

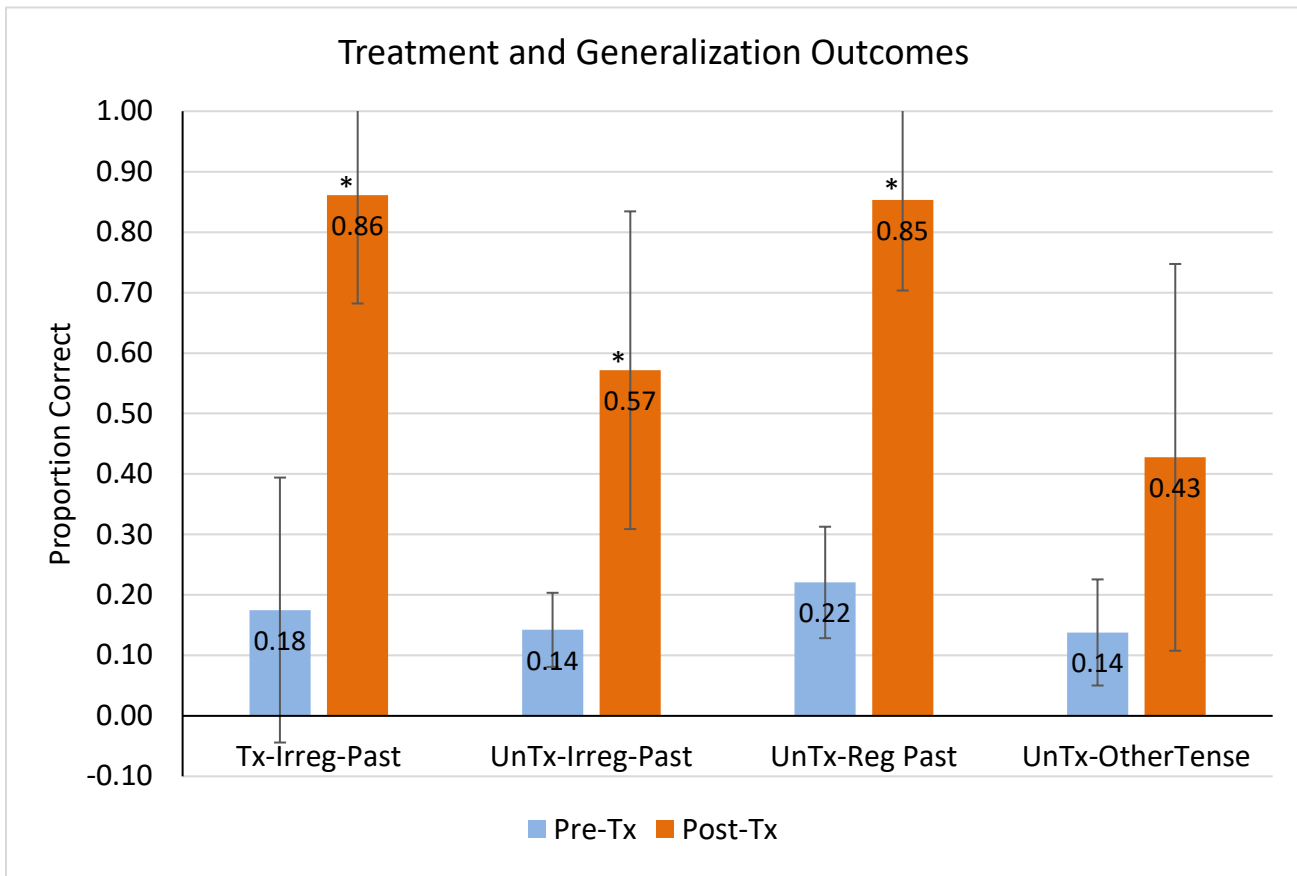


Figure 1. Mean tense production accuracy before (Pre-Tx) and after (Post-Tx) morphosemantic training with irregular past tense verbs. Error bars indicate standard deviation. * $p < .05$ (one-tailed), Wilcoxon signed ranks test.

LEGEND:

- Tx-Irreg-Past: Trained Irregular past tense verb
- UnTx-Irreg-Past: Past tense for untrained irregular verbs
- UnTx-Reg-Past: Past tense for regular verbs
- UnTx-OtherTense: Present and Future tense across all verbs