

## Effects of gesture and motion type on word learning in Spanish

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Languages use different typological strategies to express different aspects of motion events. For example, Spanish typically expresses path of motion in the verb, while English expresses path information outside the verb (e.g., particles, prepositions) and uses verbs to express manner of motion (Talmy, 1985). In addition, Spanish speakers tend to produce a higher number of expressions conveying path of motion and relatively few conveying manner of motion (Özçalışkan & Slobin, 1999; Slobin, 2004). Interestingly, gestures that accompany motion descriptions show a similar pattern of crosslinguistic variation (Kita & Özyürek, 2003). Together, these findings led us to predict that Spanish speakers would be less successful in learning new words that express manner of motion as compared with path of motion. In the present study, we asked whether Spanish speakers would likewise tend to *learn and retain* new motion words in a way that conforms with the lexicalization of motion in Spanish. In particular, we asked whether Spanish speakers would show different patterns of learning for different motion types (*path* vs. *manner*) and, if so, whether this sensitivity would be affected by the modality in which these words were presented (*speech-only* vs. *speech+gesture*).

To address these questions we analyzed data from 117 native Spanish speakers (in Santiago, Spain) using a novel word-learning paradigm. Each participant viewed repeated blocks of animations that depicted either different manners (e.g., rolling, twisting; *manner group*) or different paths (e.g., upward, downward; *path group*). After each animation, half of the participants in each group saw a training video in which a man stated a novel word for the motion just shown (e.g., ‘derlu’; *speech-only condition*); the other half saw the same man stating a novel word while producing an iconic gesture depicting the motion (e.g., ‘derlu’+move finger rapidly in circles; *gesture+speech condition*). Participant **learning** was assessed in a forced-choice task at the end of each block during training, and **retention** was assessed one week later (delayed post-test).

Our results showed a main effect of **motion type** (*manner, path*;  $F(1, 113)=62.03, p < .001, \eta_p^2=.354$ ) across test blocks 1-to-4 (Fig.1). By contrast, there was no effect of **modality** (*speech-only, gesture+speech*;  $F(1, 113)=0.65, ns$ ). Posttest analysis compared performance immediately after training (end of block 4) and one week later. This analysis revealed similar patterns: there was an effect of **motion type** ( $F(1, 89)=22.98, p < .001, \eta_p^2=.205$ ), but not **modality** ( $F(1, 89)=0.24, ns$ ). In particular, Spanish speakers were more likely to learn and retain verbal labels for motions that referred to *path* versus *manner* variations. Further, performance did not differ as a function of training **modality** (*speech-only* vs. *gesture+speech* conditions). Overall, these results suggest that Spanish speakers are better able to learn and to retain novel words that express path as opposed to manner information, consistent with lexicalization patterns in Spanish. We discuss possible implications for motion word learning in second language acquisition.

## References

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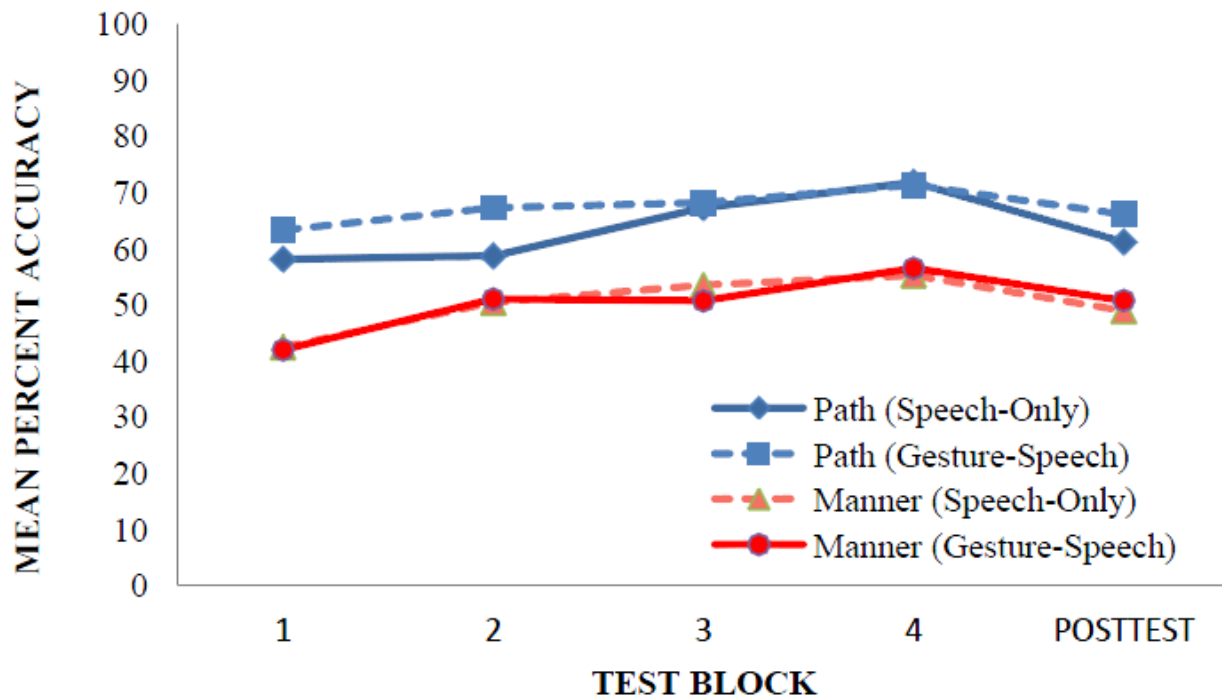


Figure 1. Mean percent accuracy on test blocks 1-4 (same day) and on posttest (one-week later)