Fifty years of behavioral and clinical research supports the hypothesis that right handers with familial left handedness (RHFLH) have a distinct patterns of language behavior, which may reflect differences in neurological organization of the lexicon. RHFLH people organize their language processing with relative emphasis on individual words, while RHFRH people are more reliant on syntactic patterns. Recent fMRI studies support the idea that RHFLH people may access words more easily than RHFRH people because their lexicon is more bilaterally represented: syntactic tasks elicit left hemisphere activation in relevant areas for all subjects; corresponding lexical/semantic tasks elicit left hemisphere activation in RHFRH people, but bilateral representation in RHFLH people. This suggests that, while syntactic representation is normally represented in the left hemisphere, lexical information and access can be more widespread in the brain. This result has implications for clinical work and interpretation of many clinical and neurolinguistics studies that fail to differentiate subjects’ familial handedness. It also is suggestive about the language-specific neurological basis for syntax, amidst a more general basis for the lexicon.