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Ever since Saffran et al.’s (1996, Science) seminal demonstration that even young infants have Statistical Learning abilities, it has been widely assumed that Statistical Learning is critical for acquiring words (and other aspects of a language). However, recent results (many of them published in PNAS, including Rungratsameetaweemana et al., 2019; Sherman & Turk-Browne, 2020) suggest that Statistical Learning does not necessarily lead to the kinds of (declarative) memory representations needed to remember words. Further, Statistical Learning abilities often evolved to have preferred target domains (e.g., Doeller & Burgess, 2008, PNAS; Dunlap & Stephens, 2014, PNAS). Here, we bring together these research strands and show that the Statistical Learning abilities thought to support learning words from fluent speech are (1) specialized in that they predominantly operate under conditions that are conducive for predictive processing, but not for word learning, and (2) dissociable from the declarative memory mechanisms needed to learn words.