Serial Order Memory: To chain or not to chain

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The touchstone task for studying serial order memory has been immediate serial recall. Subjects are presented with a series of letters, digits or words and are then required to reproduce them in order. Chaining models of serial recall propose that associations form between representations of the successive elements of the study list and that recall involves following these links (Lewandowsky & Murdock 1989). There are several lines of evidence against such a model. When subjects omit an item the next item they produce is more often the omitted item, rather than the next in the chain (Henson 1996). When lists are constructed from alternating similar and dissimilar items, performance on the similar items is impaired, but the performance on the dissimilar items is not (Henson, Norris, Page, Baddeley 1996). In addition, when an item that appeared in the list prior to the current protrudes, it tends to appear in the same position as it did in the prior list (Conrad 1960). Taken together these results, suggest that some form of positional code is at play (Henson 1996).

However, when lists are constructed from high probability letter bigrams (Baddeley 1964) or words sequences that approximate language (Miller & Selfridge 1951) performance is improved dramatically despite the fact that the statistics that are relevant to these phenomena are not position dependent. In addition, when rotated versions of a list are repeated (e.g. ABCDEF, EFABCD, CDEFAB), retaining chaining information but confounding position information, learning is strong (Addis & Kahana 2005). So, the question remains is chaining the basis of serial memory?

In this talk, I will present a chaining model capable of accounting for a number of benchmark phenomena from the area as well as those list above that have been used to rule out chaining accounts. Rather than propose that associations are followed sequentially to recall each item in turn, the model assumes that the associations retained from study operate as a set of constraints that determine the probability of producing a given output list.