Retroactive Inhibition Does Not Always Occur With Similar Items

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The paired-associate (PA) learning method is described in detail in Melton (1970). In essence, the subject is presented with a set of items. Each item is made up of a stimulus and response pair. Each item is introduced to the subject one or more times and then the memory of the response is tested by the presentation of the stimulus term alone. The set is considered learned if the subject correctly identifies the response to each stimulus two consecutive times through the set (Barnes & Underwood, 1959).

Studies in PA learning have shown that when a stimulus-response pair in the second set has a stimulus item that is very similar to a stimulus item in the first set, that the response from the first set is wiped out. Many studies have addressed the interlist effects of a range of similar stimulus items, and of retention of the first list. Consistently, the results show that with stimuli identical and responses running from neutral to different there is retroactive interference, decreasing in magnitude as stimulus similarity decreases.

However, the literature does not address what happens if the subject knows he needs to remember the first list. While simplifying assumptions are often made in an experiment, they do not necessarily validate the conclusions that can be drawn from the results. In particular, they should not be so simple that they do not reflect reality. In most cases, subjects in PA experiments do not have to remember the things they first learn when learning new items. This places a major restriction on how you learn in the real world---cumulatively. Not having to learn cumulatively opens the way for interlist confusions, that is, assigning different associations to similar stimuli, and forgetting the items in the first list. If one has to learn cumulatively, as in the real world, retroactive inhibition does not hold in the way it has been reported.

In my experiment, participants learned 16 characters of the Japanese Katakana syllabary---eight on one day, and eight on the following day. Letters were taught using the PA method. Six of the letters in the second list were rated as highly similar to six letters in the first list by an independent group of judges. After learning the first set of letters, the subjects practiced by reading words made of the letters. The letters learned on the first day were practiced again on the second day, and then the second set presented and learned. Participants did not see the first set of letters when learning the second set. After learning both sets, participants read a passage containing all 16 letters, each appearing 25 times, for a total of 400 letters. The results presented here are based on the mistakes the subjects made in that reading. These subjects made an average of 25.8 confusions between the highly similar letters, and an average of 24.8 errors of other types. A confusion is defined as saying the name of one letter when seeing its similar counterpart. These were both very high error rates compared to the other experimental groups. (Because the other experimental conditions are not relevant to the result being presented, I will not go into more detail about them.) Based on previous results from research in PA learning, one would predict that subjects would always say the second-list item when seeing either a first- or second-list item. This did not happen. Subjects incorrectly said the names of first-list items when seeing second-list items 36% of the time; they incorrectly read first list items 64% of the time, saying the second-list item instead. That is, subjects still remembered the first item somewhat. No subject confused all six similar pairs---most confused at least the two pairs that were rated as the most highly similar. Of those pairs, confusions went in both directions; there was also a similar ratio of reading the first- and second-list items correctly.

One possible explanation is that the learners remembered *that* they learned the first item, and that when tested later will try to use all the information that they learned. If that were true, then there would be some measure of randomness in how often the first-list item was said. But that does not seem to be the case. The first-list item is still in memory.

In summary, existing research in PA does not extend outside of the narrow range of tasks in which the original associations are to be erased, or in which stimulus-response pairs for similar stimuli are all to be retained indefinitely. Other people have made this criticism on general principles, but my experiment offers empirical evidence that retroactive inhibition does not occur outside the narrow limits explored by PA studies so far.

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References

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