Three Experiments by Slamecka on Remote Associations in Serial Verbal Learning

In all of the experiments, the items were presented by the serial anticipation procedure, with each item presented for 3 seconds and an intertrial of 6 seconds.

The dependent variable was the number of trials needed to reach a mastery criterion (1 trial without an error in Exp 1 and 2 trials without an error in Exps 2 and 3).

After participants learned their original list, they were given 1 of 3 types of derived lists.

Patterned List: A standard 1st-order derived list that was constructed by skipping every other item in original list, e.g.

A B C D E F G H I J K became A C E G I K...

Modified 1st-Order List: 0, 1, or 2 items were skipped but the average was 1 item skipped. Ebbinghaus would predict the same results whether the number of items skipped varied but averaged out to 1 or whether 1 item was always skipped, e.g.,

A D E G H K...

But the patterned list has a clearer relationship to the original list so if it’s necessary for participants to perceive the relationship between list, the patterned list should be learned faster than the modified list.

Control List: The original items were re-arranged in a haphazard, random order.

Participants were told that the derived list would consist of the same items as the original list but in a different order. The rule relating the lists should be easiest to see with the patterned list.

**Experiment 1: Items were 14 single letters. e.g A to N.**

Participants were told that the original list was in alphabetical sequence and were told the letter it started with.

**Mean Trials to Criterion**

Patterned List: 4.94 (Original List: 1.06)

Modified 1st-Order List: 7.61 (Original List: 1.06)

Control List: 7.94 (Original List: 1.06)

Statistically, patterned was listed faster than modified (which goes against Ebbinghaus’s theory) and modified = control.
**Experiment 2: Items were 12 nonsense syllables.**

This experiment was similar to Ebbinghaus’s except that Ebbinghaus knew the relationship between the original and derived lists (since he was the participant as well as experimenter) and these participants didn’t.

How important is it to have information on the relationship between lists?

Ebbinghaus would say it doesn’t matter because the learning of remote associations is automatic during the learning of the original list and does not depend on understanding the relationship between that list and the derived list.

**Mean Trials to Criterion**

Patterned List: 13.30 (Original List: 20.45)

Modified 1st-Order List: 12.95 (Original List: 19.95)

Control List: 13.55 (Original List: 20.6)

Statistically, there was no difference between any of the derived lists.

Compare to Experiment 1: With single letters, the relationship between the original list and patterned list was easier to see so there was a carry-over effect.

**Experiment 3: Same as Experiment 2 But Participants Were Told Precise Relationship Between Lists**

In addition, each nonsense syllable was numbered and the same number was used in the derived list so the relationship would be easier to see.

**Mean Trials to Criterion**

Patterned List: 10.90 (Original List: 19.90)

Modified 1st-Order List: 12.05 (Original List: 20.25)

Control List: 14.10 (Original List: 20.80)

Statistically, the patterned list was learned faster than the control.

The modified list was intermediate and not significantly different from the other two lists.

**Conclusion:** With the patterned list, learning was only improved when participants were informed of its relationship to the original list (like Ebbinghaus himself).