

Figure 14.6 Acquisition of word pairs as a function of drug condition and type of pair. Adapted from Reder et al. (2007).

result of retrograde facilitation in the presence of midazolam? When Lists 2 and 3 were studied in the midazolam condition, the List 1 control pairs did not differ from the List 1 interference pairs; however, when the pairs for Lists 2 and 3 were studied in the saline condition, performance on interference pairs from List 1 was not as good as recall for the control pairs.

Retrograde facilitation had been defined as the difference in performance between the midazolam and saline condition performance. Such facilitation was only found for the interference word pairs, even though performance on those pairs did not differ from performance on the control pairs. The same pattern was observed with latency. List 1 word pairs that were recalled slower if they ended up being interference pairs than if they were control pairs. On the other hand, word pairs that were studied prior to a midazolam injection were responded to equally fast, regardless of the assignment of those pairs to control vs. interference condition. Our explanation for this pattern of findings is that under midazolam subjects did not suffer from the effects of interference because they could not form new associations to words studied after the injection. Rather than interpreting the pattern as *retrograde facilitation* due to enhanced consolidation, the pattern can be understood as differing amounts of interference. We modeled these effects, fitting the acquisition and recall accuracy, errors in

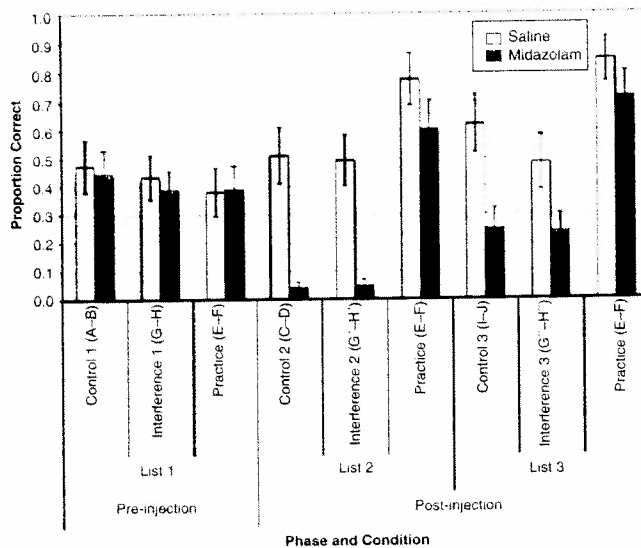


Figure 14.7 Final recall of word pairs as a function of drug condition and type of pair. Adapted from Reder et al. (2007).

recall, and latencies for both the drug and the saline conditions (see Figures 14.8 and 14.9). We explained the pattern by assuming different probabilities of forming an association between the words in a pair and between the pair and the list and general context. We assumed that the probability of forming a new association from the stimulus word to the response term and to the list context and general experimental context is affected by midazolam, which affects the hippocampal system. As the drug wears off, the probability of forming a new association increases. There was no need to postulate a consolidation mechanism to get excellent fits (model fits can be seen at http://memory.psy.cmu.edu/model_fits.php).

Conclusion

Memory is a complex system that performs many functions and relies on a range of neurological structures. The system is highly integrated, and damage to different parts of the brain that results in amnesia disrupts the same underlying functional loop. The specific memory deficits seen in drug-induced anterograde amnesia can provide further understanding of the