

## Removing the trace of foil words from the recognition data in Malmberg et al

Eugen Tarnow, Ph.D.  
18-11 Radburn Road  
Fair Lawn, NJ 07410  
646 229 0787  
etarnow@avabiz.com

In Malmberg, Criss, Gangwani and Shiffrin (2012), "Overcoming the Negative Consequences of Interference From Recognition Memory Testing" (I thank Ken Malmberg for providing the data), it was shown that recognition memory depends upon how it is tested: if two categories of words are tested simultaneously or separately the results are different with better recognition for the first items in the second category if the tests are separate. In other words, memory in two different categories seems to be relatively separate.

The results in Malmberg et al can be derived from the number of left-hand side foils used: the left-hand side foils are equivalent to studied words (the right-hand side foils may be ignored by the subject). With 75 words studied and n foils used the probability of recognizing a studied word is proportional to

$$f(75,n)=75/(75+n) \text{ (equation 1)}$$

The experimental figure 2 in Malmberg et al shows the proportion correct which is

$$0.5*(p+.5)=0.5*(f(75,n)*p(n=0)+1) \text{ (equation 2)}$$

The experimental data together with the theoretical prediction is shown in Fig. 1a of the current comment.

In Fig. 1b is shown how the corrected experimental data would look, now presumably independent of the testing method with the interference "overcome". Using the average time after study at the first test of 165 seconds, we find that the probability of correct responses decays logarithmically with time as  $1.18 - 0.10 \ln(t)$ , similar to other short term memory data analyzed in Tarnow (2008).

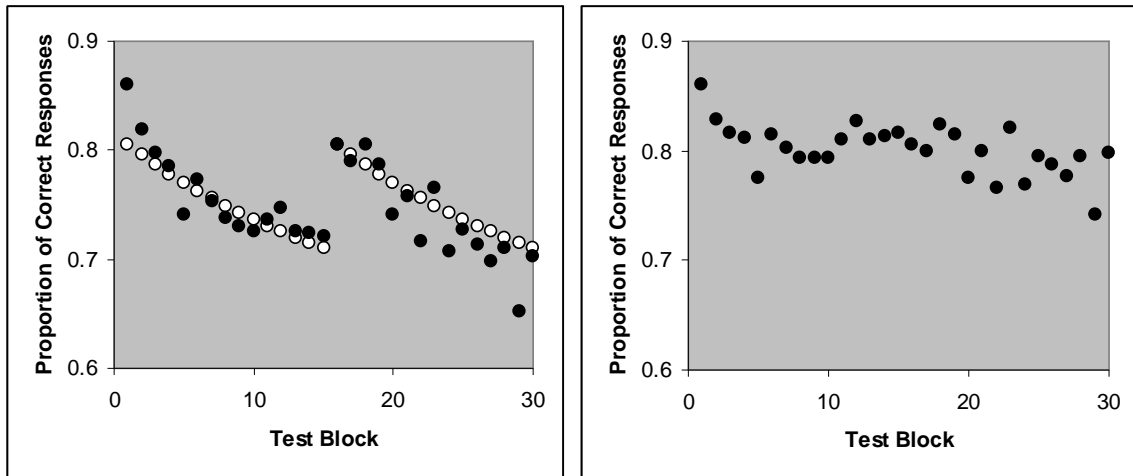


Fig. 1. (a) (left panel) proportion correct responses from Malmgren et al (filled circles) and using equation 2 (unfilled circles). The break between the first and last 15 blocks is clearly visible. (b) proportion correct responses from Malmgren with the foil correction removed. The data from the two blocks is continuous with no visible break.

## REFERENCES

Kenneth J. Malmberg, Amy H. Criss, Tarun H. Gangwani and Richard M. Shiffrin, Overcoming the Negative Consequences of Interference From Recognition Memory Testing (2012), *Psychological Science* 2012 23: 115

Eugen Tarnow 2008 Response probability and response time: a straight line, the Tagging/Retagging interpretation of short term memory, an operational definition of meaningfulness and short term memory time decay and search time, *Cognitive Neurodynamics*, 2008, 2(4), 347-353.