A reply to Wenderoth's comment

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It was suggested by Wenderoth that data had been misinterpreted because of an inconsistency between two dependent variables in a study on the one-trial learning controversy initiated by Rock. The study was further explicated and it was concluded that the previous interpretation was satisfactory.

Professor Wenderoth correctly points out that we did not replicate Rock's (1957) experiment. Since the procedures in our study differed from those described by Rock, a claim to have done so would have been unwarranted on our part. When considering the analysis of error rates in reaching criterion between Groups DOC and C1 in the first part of the study, however, we found, as did Rock, no statistically significant differences. As we stated in our paper, "the results of the analysis over number of errors ... are in agreement with Rock's ... findings [Breckenridge & Kooker, 1969, p. 314]." The addition of our third group, as suggested in the studies by Postman (1962) and by Underwood, Rehula, & Keppel (1962), has no bearing on any argument about replication or on the DOC-C1 comparison since Rock ran only the two latter groups.

Wenderoth also points out that, on this same dependent measure, statistical tests indicated that (1) C1 did not differ from C2, (2) C1 did not differ from DOC, while (3) C2 differed statistically from DOC. There is, as he observed, an apparent internal contradiction. However, the test used was the Newman-Keuls procedure, which maintains the level of significance equal to α for all ordered pairs (Winer, 1962). This is a conservative approach since significant differences would have been more readily found had individual comparisons been used. Wenderoth suggests two alternative approaches. First, he suggests trend analysis. He notes, however, that "the assumption of quantitatively equal spacing of the treatments is questionable." We concur, since it is not clear that the scale upon which the three groups fall is anything but nominal.

Planned comparisons are also suggested. The comparison between DOC and C2 is reasonable. It has been previously demonstrated by Postman (1962) and Underwood et al (1962) that a difference might be expected here. We also reported this difference, using the Newman-Keuls procedure. Wenderoth also suggests the comparison of DOC + C2 – 2(C1). As far as we can see, this comparison, between the combination of the experimental one-trial group (DOC) and the item-selection control group (C2) and the weighted total of the repetition control group (C1), is not psychologically meaningful. There are two other comparisons that are reasonable and that were made in the Newman-Keuls procedure: C2 – C1 and C1 – DOC. As noted above, they were not found to be significant. Wenderoth suggests that "it is probable that Breckenridge and Kooker's Group DOC performed at a lower level than Group C1, both in terms of errors to criterion and mean items recalled." Using a less conservative and simple t-test, a comparison of Groups C1 and DOC was again computed for the number of errors to criterion. A t of 0.971, with df = 32, was not significant. The inconsistency that concerns Wenderoth thus remains. From these data we do not see that there is any evidence for concluding that, on errors to criterion, C1 differed from DOC. When a more sensitive measure of recall is utilized, C1 does prove to be superior to DOC. This is what was hypothesized. This, we contend, agrees with Rock's finding in the first instance, and in the second, supports an incremental theory of learning.

REFERENCES

BRECKENRIDGE, R. L., & KOOKER, E. W. On Rock's one-trial learning controversy. Psychonomic Science, 1969, 15, 313-314.

POSTMAN, L. Repetition and paired associate learning. American Journal of Psychology, 1962, 75, 372-389.

ROCK, I. The role of repetition in associate learning. American Journal of Psychology, 1957, 70, 186-193.

UNDERWOOD, B. J., REHULA, R., & KEPPEL, G. Item-selection in paired associate learning. American Journal of Psychology, 1962, 75, 353-371.

WINER, B. J. *Statistical principles in experimental design.* New York: McGraw-Hill, 1962.

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