generally in that vicinity during the S^- stimulus also. The height of this mode associated with the various schedules and stimulus intensities is shown in Fig. 1. While there is no consistent difference between the two S^+ values, the mode in S^- is always the lowest. This pattern is consistent in spite of the differences in the rates described above.

References

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Notes

1. This research was supported by Public Health Service Grant MH-06911-01.

2. Now at Denison University, Granville, Ohio.

Reply

Dr. Longstreth's comments ask two basic questions: (1) Were the ratio scores justified? Is it possible that pre-test differences may have contaminated the ratio measures and thereby produced the differences which we attribute to the reinforcement effect of the tone? (2) How do we justify our conclusion in view of the fact that the no-shock, no-tone control group was higher than any experimental group?

The first question can be answered by an examination of the pre-test data. The number of responses made by the different groups during the half-hour pre-test run does show some variability. That was the reason for our use of ratios. Figure 1 illustrates the raw data. The deviant groups are the 2-shock-tone experimental group and the 20-shock control group. If the pre-test rates alone affected the post/pre-test ratios in the final data analysis, the 2-shock-tone group should be higher than the other experimental group; however, this group is not significantly different from the other groups. The 20-shock control group should be lower than its experimental group; they are not significantly different. In fact, in both cases the direction of the differences is in the opposite direction. In the light of this data, we feel that the use of ratio scores is perfectly justified.

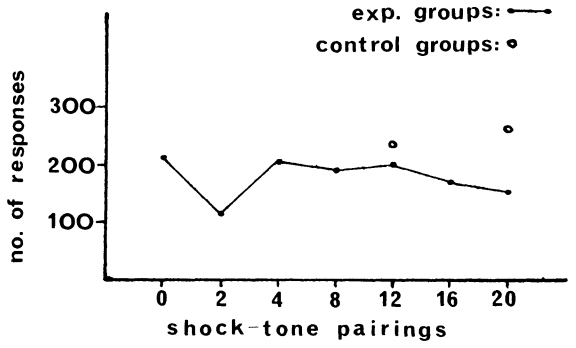

Fig. 1. The mean number of responses made during the pre-shock 30-min. period of free responding.

Dr. Longstreth also questions our statistical analysis and suggests that we need an "...overall test of difference in means..." We certainly would not have considered using the t and Tukey A test before performing an analysis of variance. The F was 4.57 with 6 and 28 degrees of freedom. Such an F justifies all of our tests between selected pairs of means. The Tukey A test was used because it lowers the possibility of a Type 1 error when making several intergroup comparisons. Despite the conservative nature of the test, our differences were significant.

The differences between our experimental and 0-shock-tone control groups are basic to the whole idea of our study. Since shock exposure, per se, lowers the post-shock rates, we feel that the reinforcing effects of a post-shock stimulus can only be determined by comparing animals who have been exposed to shock. In this case, we are comparing Ss who have all been exposed to a treatment, which severely affects the response rate. Thus the difference between our 12-shock-tone and 12-shock-0 groups shows that the post-shock tone raised the already depressed rate. If we compared the 12-shock-tone group to a no-shock group, the reinforcing effects of the tone would be masked because of the depression produced by the shock.

If, as Dr. Longstreth suggests, the tone itself were facilitory, we would expect the other experimental groups to show more responses to extinction. They were significantly below the 12-shock-tone group, despite the fact that some experimental Ss had more experience with the tone. Thus we believe this criticism is invalid. In short, we do not find any suggestions in these comments that invalidate our conclusions.

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(See page 242 for comment by L. E. Longstreth)