Notes and Comment

Reviews of reward contrast effects: An addendum

ALLAN M. SCHRIER
Brown University
Providence, Rhode Island

This short note calls attention to a set of studies, including those by Lawson (1957), Leary (1958), Meyer (1951), and the writer (1958), concerned with effects of shifts in amount of reward that have been repeatedly overlooked in prominent reviews of the literature on that topic (Black, 1968; Dunham, 1968; Flaherty, 1982). The study that stimulated what developed into a very large literature on reward shift effects was Crespi's (1942) on runway performance of rats. He reported both positive and negative contrast effects, that is, better than expected performance when the amount of reward per trial was increased and worse than expected performance when the amount of reward per trial was decreased. Subsequent studies (described in the reviews by Black and by Dunham, as well as in a section of a chapter by Kling & Schrier, 1971), primarily with rats in runways, readily confirmed the existence of negative reward contrast, but raised doubts about the existence of positive reward contrast. On the basis of their reviews of the literature, which were widely cited in subsequent years, both Black and Dunham concluded that there was no substantial evidence for positive reward contrast. This was an important question because it has always been easier to account theoretically for negative reward contrast than for positive (Spence, 1956).

What makes the set of overlooked studies of special interest is that they suggest conditions under which stable positive reward contrast can be observed. In addition, they apparently no longer stand alone in that respect. Flaherty (1982), in an excellent review of the more recent literature on reward shift, has concluded that there is now substantial evidence for the existence of positive reward contrast. I might also mention that the reports by Lawson (1957) and the writer (1958) call attention to differences in reward shift procedures that were closely related to those that were made much of in these and later reviews. It is not clear why Black and Dunham failed to discuss the set of studies cited above. It probably had to do in part with the fact that the great bulk of the work was concerned with performance in runways or in Skinner boxes, whereas the omitted studies were concerned with fre-

quency of correct responses in discrimination learning situations. I suspect that another reason is that all but one (Lawson, 1957) of the omitted studies used monkeys as the subjects. It has not been unusual for supposedly comprehensive reviews of phenomena in the area of learning and motivation to exclude studies carried out on monkeys, while including studies on animals as disparate as pigeons and rats. Flaherty (1982) failed to mention the studies in question because he limited his review to those published since the reviews by Black and Dunham.

Since the studies are described in detail in the chapter by Kling and Schrier (1971), I will not do so here. However, Kling and Schrier summarized the conditions (p. 638) that seem to consistently produce both positive and negative reward contrast in discrimination situations, and it seems worthwhile to repeat them here: (1) simultaneous two-choice discrimination problems, (2) only one of the choice responses is rewarded, and (3) the amount of reward per trial is repeatedly shifted from trial block to trial block using a set of two or more amounts. These are not exclusive conditions, nor is the data pertaining to them definitive. However, the data are clear enough to merit consideration in discussions of reward shift effects.

REFERENCES

- BLACK, R. W. (1968). Shifts in magnitude of reward and contrast effects in instrumental and selective learning: A reinterpretation. *Psychological Review*, **75**, 114-126.
- CRESPI, L. R. (1942). Quantitative variation of incentive and performance in the white rat. *American Journal of Psychology*, **55**, 467-517.
- DUNHAM, P. J. (1968). Contrasted conditions of reinforcement: A selective critique. *Psychological Bulletin*, **69**, 295-315.
- FLAHERTY, C. F. (1982). Incentive contrast: A review of behavioral changes following shifts in reward. *Animal Learning & Behavior*, **10**, 409-440.
- KLING, J. W., & SCHRIER, A. M. (1971). Positive reinforcement. In J. W. Kling & L. A. Riggs (Eds.), *Woodworth & Schlosberg's experimental psychology: Vol. II. Learning, motivation, and memory* (3rd ed., pp. 615-702). New York: Holt, Rinehart and Winston.
- LAWSON, R. (1957). Brightness discrimination performance and secondary reward strength as a function of primary reward amount. *Journal of Comparative and Physiological Psychology*, **50**, 35-39.
- LEARY, R. W. (1958). Homogeneous and heterogeneous reward of monkeys. *Journal of Comparative and Physiological Psychology*, **51**, 706-710.
- MEYER, D. R. (1951). The effects of differential rewards on discrimination reversal learning by monkeys. *Journal of Experimental Psychology*, **41**, 268-274.
- SCHRIER, A. M. (1958). Comparison of two methods of investigating the effect of amount of reward on performance. *Journal of Comparative and Physiological Psychology*, **51**, 725-731.
- SPENCE, K. W. (1956). *Behavior theory and conditioning*. New Haven: Yale University Press.

The author's mailing address is: Department of Psychology, Brown University, Providence, RI 02912.

(Manuscript received September 21, 1984;
revision accepted for publication November 20, 1984.)