Notes and Comment

In response to and in defense of Mitchell and Revusky: An analysis of nonassociative effects

ANTHONY L. RILEY

The American University, Washington, D.C. 20016

The existence of nonassociative factors and their contribution to both traditional and contemporary analyses of learning have recently generated considerable interest and discussion (Bitterman, 1975; LoLordo, 1978; Mackintosh, 1974). The recent exchange of comments between Mitchell (1977) and Revusky (1977) reflects that food aversions have not escaped a similar concern. The difficulty in attempting to elucidate the possible role of nonassociative factors in the avoidance of previously poisoned foods, however, is made clear from the discussion between Mitchell and Revusky. The problem arises from the fact that, while presenting opposing views, Mitchell and Revusky clearly are both correct. Mitchell asserts that nonassociative controls have, in general, been omitted in the analysis of the determinants of food aversions. Mitchell is correct. Revusky, on the other hand, argues that the experimental literature on food aversions has sufficiently analyzed the role of nonassociative factors. In these analyses appropriate nonassociative controls were run. Revusky, too, is correct.

The issue becomes a bit clearer when one defines nonassociative. It is readily apparent that this concept has a number of meanings. The literature on food aversions in the late 50s and early 60s did assess the possible role of nonassociative factors in food aversions (see Riley & Clarke, 1977; non-associative effects). In these early assessments, "nonassociative" apparently meant the contribution of factors other than the control exerted by the CS-US contingency, i.e., the taste-illness pairing. Such nonassociative control groups as taste alone, illness alone, and taste and illness specifically unpaired were all examined. The results were unequivocal. Unless the taste and illness were paired, there was no aversion to the test solution. It is important to note exactly what these controls were assessing. The nonassociative controls were assessing the contribution of factors that were independent of the contingency between the CS and US. As controls for this purpose, these groups were appropriate and adequate. Revusky is correct.

A second definition of nonassociative effects and a totally separate approach to their measurement were introduced by Chitty (1954), Barnett (1963), and Rzoska (1954), and have recently been thoroughly analyzed (Best & Batson, 1977; Carroll, Dinc, Levy, & Smith, 1975; Domjan, 1977). This second approach redefines nonassociative with the addition of neophobia—the rat's innate tendency to avoid consumption of novel foods and solutions. Neophobia, which is accentuated by illness or stress, could be a factor that contributes to or totally mediates what has been assumed to be conditioned, i.e., the avoidance of previously poisoned foods. The aforementioned controls that tested for the effects of taste alone, illness alone, or unpaired taste and illness presentations are no longer necessarily adequate. The nonassociative effects of these manipulations must be assessed on novel test solutions and within a design in which neophobia can be demonstrated. It is important to note that the controls that originally tested for nonassociative effects seldom allowed for the assessment of nonassociative *neophobic* effects. There does appear to be a paucity of appropriate nonassociative controls. Mitchell is correct.

That neophobia exists and controls the rat's consumption of novel solutions is not in question. Its role in food aversions is. To criticize past research for its lack of precognition, however, is hardly appropriate (Bitterman, 1975, 1976, 1977; Mitchell, 1977, 1978). To criticize current research for attempting to investigate thoroughly a phenomenon is also inappropriate (Garcia, 1978; Revusky, 1978; Smith, 1978). The proper assessment of both associative and non-associative factors in the avoidance of previously poisoned foods is necessary and correct.

REFERENCES

- BARNETT, S. *The rat: A study in behavior*. Chicago: Aldine Press, 1963.
- BEST, M., & BATSON, J. Enhancing the expression of flavor neophobia: Some effects of the ingestion-illness contingency. *Journal of Experimental Psychology: Animal Behavior Processes*, 1977, 3, 132-143.
- BITTERMAN, M. The comparative analysis of learning: Are the laws of learning the same in all animals? *Science*, 1975, 188, 699-709.
- BITTERMAN, M. Reply to Garcia, Hankins, and Rusiniak. *Science*, 1976, 192, 266-267.
- BITTERMAN, M. Issues in comparative psychology of learning. In R. Masterton, M. Bitterman, C. Campbell, & N. Hotton (Eds.), *Evolution of brain and behavior in vertebrates*. Hillsdale, N.J: Erlbaum, 1976.

- CARROLL, M., DINC, H., LEVY, C., & SMITH, J. Demonstrations of neophobia and enhanced neophobia in the albino rat. *Journal of Comparative and Physiological Psychology*, 1975, **89**, 457-467.
- CHITTY, D. The study of the brown rat and its control by poison. In D. Chitty (Ed.), *Control of rats and mice* (Vol. 1). Oxford: Clarendon Press, 1954.
- DOMJAN, M. Attenuation and enhancement of neophobia for edible substances. In L. Barker, M. Best, & M. Domjan (Eds.), *Learning mechanisms in food selection*. Waco, Tex: Baylor University Press, 1977.
- GARCIA, J. Mitchell, Scott, and Mitchell are not supported by their own data. *Animal Learning & Behavior*, 1978, **6**, 116.
- LOLORDO, V. Selective associations. In A. Dickinson & R. Boakes (Eds.), *Mechanisms of learning and motivation: A memorial to Jerzy Konorski*. Hillsdale, N.J: Erlbaum, 1978.
- MACKINTOSH, N. *The psychology of animal learning*. London: Academic Press, 1974.
- MITCHELL, D. Reply to Revusky. *Animal Learning & Behavior*, 1977, **5**, 321-322.
- MITCHELL, D. The psychological vs. the ethological rat: Two views of the poison avoidance behavior of the rat compared. *Animal Learning & Behavior*, 1978, **6**, 121-124.
- REVUSKY, S. Correction of a paper by Mitchell, Scott, and Mitchell. *Animal Learning & Behavior*, 1977, **5**, 320.
- REVUSKY, S. Reply to Mitchell. *Animal Learning & Behavior*, 1978, **6**, 119-120.
- RILEY, A., & CLARKE, C. Conditioned taste aversions: A bibliography. In L. Barker, M. Best, & M. Domjan (Eds.), *Learning mechanisms in food selection*. Waco, Texas: Baylor University Press, 1977.
- RZOSKA, J. The behavior of white rats towards poison baits. In D. Chitty (Ed.), *Control of rats and mice* (Vol. 2). Oxford: Clarendon Press, 1954.
- SMITH, J. Comment on paper by Mitchell, Scott, and Mitchell. *Animal Learning & Behavior*, 1978, **6**, 117-118.

(Received for publication July 18, 1978.)