Notes and Comment

More about appropriate controls for taste aversion learning: A reply to Riley

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Riley (1978) agrees with Revusky (1978) that food aversion learning is associative by traditional Pavlovian standards, but claims that it may be nonassociative according to a second approach.

This second approach redefines nonassociative with the addition of neophobia—the rat's innate tendency to avoid consumption of novel food and solution. Neophobia, which is accentuated by illness or stress, could be a factor which contributes to or totally mediates what has been assumed to be conditioned, i.e., the avoidance of previously poisoned foods (Riley, 1978).

According to Riley, this redefinition of nonassociative implies that control groups subjected to the unpaired taste and sickness "are no longer necessarily adequate"; because the animal is familiar with the taste at the time of testing, there can be no assessment of nonassociative neophobic effects. Thus, Riley concludes that there "does appear to be a paucity of appropriate nonassociative controls."

Nonassociative neophobic effects of sickness correspond to sensitization of ordinary Pavlovian responses. Hence, contrary to Riley, they do not indicate that sensitization controls similar to those appropriate for Pavlovian conditioning may be inadequate for taste aversion learning. The same logic applies to both cases. When an animal learns an association between events A and B, it learns three types of things: (1) about A, (2) about B, and (3) about the fact that A and B are associated. Associative learning refers only to the last of these and cannot validly be inferred from changes in behavior caused by learning about A alone (e.g., habituation) and/or about B alone (e.g., sensitization). On this basis, associative learning of a taste aversion occurs because of experience that the taste precedes or coincides with toxicosis and not because of experience with the taste alone and/or the toxicosis alone. The unpaired con-

trol group regarded by Riley (1978) as "no longer necessarily adequate" is equated with the experimental group for experience with the taste alone and with toxicosis alone so that effects of these experiences cannot distort the assessment of associative learning. The novel-taste control advocated by Riley is inferior for most purposes because it is not equated for experience with the taste. Still, this control has been used often enough to show that taste aversions previously assumed to be conditioned cannot be attributed to nonassociative factors even by Riley's redefinition (Barker, 1976; Bond & Harland, 1975; Lorden, Kenfield, & Braun, 1970; Mackay, 1974; McLaurin, 1964; Nowlis, 1974; Smith & Birkle, 1966).

None of the three papers Riley cites as recent evidence that neophobia is enhanced by prior sickness indicates that neophobia can account for pronounced and long-lasting taste aversions. Carroll, Dinc, Levy, and Smith (1975, p. 466) state that "neophobia and enhanced neophobia are short-lived phenomena." Domjan (1977, pp. 173-174) claims that enhanced neophobia not due to stimulus generalization between two flavors "will be observed only as long as the subjects are presumably suffering from the toxin malaise" and is not observed with lower doses of poison "though such doses have been found to condition taste aversions." The enhanced neophobia obtained by Best and Batson (1977) also was weaker than a conditioned aversion, and I think there is good evidence that it would have been still weaker in the absence of stimulus generalization between coffee and vinegar flavors (Parker, 1979).

Contrary to Riley (1978), I have never criticized "current research for attempting to investigate thoroughly a phenomenon." I agree with him that "proper assessment of both associative and nonassociative mechanisms in the avoidance of previously poisoned foods is necessary and correct" and have myself investigated both types of factors (Revusky, Parker, Coombes, & Coombes, 1976). I also believe that novelty is a factor in all conditioning and have shown how neophobia enhances taste aversions (Revusky & Bedarf, 1967). However, I disagree with Riley's suggestion that counterparts of control procedures which have been adequate in traditional learning situations may be inadequate for taste aversion learning.

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Editor's Note—As it is unlikely that the issue of what constitutes proper controls in conditioned taste-aversion studies will be significantly illuminated by further comments, this is absolutely the last word on the topic. Let us look to experimental data for further edification.

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