Notes and Comment

Comment on Schicatano and Blumenthal (1994): Habituation or sensitization?

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Schicatano and Blumenthal (1994) proclaim in their title that “caffeine delays habituation of the acoustic startle response” and conclude in their summary that “caffeine disrupts early sensory filtering.” Neither title nor conclusion is justified by the data presented. The authors have failed to make the distinction routinely made in the habituation literature (e.g., Leaton & Tighe, 1976) between habituation and sensitization. It is impossible to conclude from the data presented whether caffeine “delayed habituation” or enhanced sensitization. Since caffeine “enhances physiological responses to arousing external stimuli,” as the authors conclude from the Smith, Rafferty, Lindgren, Smith, and Nespor (1991) paper, one might expect the drug to enhance sensitization. However, the main point of this comment is that one cannot tell from the data which process has been affected.

Thompson and his associates (Groves & Thompson, 1970; Thompson & Glanzman, 1976; Thompson & Spencer, 1966) have probably made the clearest distinction between habituation and sensitization in the context of their dual-process theory of habituation. According to this theory, the early course of habituation training is accompanied by an increase in both habituation—the response reducing process—and sensitization—the response enhancing process. What the actual resultant response curves look like will depend on the relative contribution of these two processes. The data that Schicatano and Blumenthal (1994) display in their Figures 1 and 3 could readily be accounted for by a caffeine-induced enhancement of sensitization. We have argued on several occasions (e.g., Borszcz, Cranney, & Leaton, 1989; Leaton & Cranney, 1990) that sensitization can mask the effects of habituation, and we have shown that brain lesions (Borszcz et al., 1989; Leaton & Supple, 1987) and drugs (Young, Helmstetter, Rabchenuk, & Leaton, 1991) may appear to facilitate habituation through their action on the sensitization process.

Dishabituation, which the authors show us in their Figure 2, is usually conceptualized as a disruption of the basic habituation process, and the authors imply this con-

ceptualization. Again, Thompson and his associates (e.g., Thompson & Glanzman, 1976) have argued persuasively that demonstrations of “dishabituation” typically reflect the operation of an independent excitatory process, sensitization—not disruption of the basic habituation process. What we pointed out earlier (Leaton & Tighe, 1976) continues to be true: experiments that distinguish “true” dishabituation from response increases associated with sensitization are rare indeed. Wagner’s theory of habituation (1976) provides a mechanism for “true” dishabituation, and Whitlow (1975) provides one of the few empirical examples of such dishabituation.

Does all of this make any difference? After all, we are talking about response decrements, and surely the authors show that caffeine delays response decrement in this paradigm. I believe, though, that these conceptual distinctions do make an important difference. Conclusions obviously are derived from the assumptions made about the underlying processes. If it is sensitization that caffeine affects, we would probably not wish to conclude that “caffeine disrupts early sensory filtering.” Given what we know about the excitatory effects of caffeine, it seems more parsimonious to assume that caffeine simply enhances sensitization. Since we cannot tell from the data which of these processes may be involved, our interpretations (and our descriptive titles) ought to be tempered by our uncertainty.

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