

## A REPLY TO EDMONSTON

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*Summary.*—Further elaboration and support for the conclusions drawn from Piedmont's 1981 article on hypnosis and biofeedback, with respect to Edmonston's following evaluation of this study, are given. Both theoretical and empirical information are discussed to support a cognitive approach to understanding hypnosis. Final resolution of this issue can only be accomplished through more elaborate empirical inquiry.

In a recent article (5) an attempt was made to combine both hypnosis and biofeedback in a single experimental design to assess their combined influence upon biofeedback training (in this case, the lowering of peripheral dermal temperature). This was done on the logical assumption that the two processes of hypnosis and biofeedback were cognitively compatible and employed similar cognitive strategies.

The results of the above study have come under debate. The central question focuses on the conclusions drawn from the data, namely, that the cognitive component of hypnosis was responsible for the hypnotized group performing more in the desired direction than the control group (non-hypnotized) with respect to the lowering of skin temperature.

The purpose of this study was to determine the effectiveness of hypnosis in tandem with biofeedback procedures. To demonstrate clearly any potentiation of thermal learning *vis à vis* hypnosis, it was necessary (a) to have a clear, simple experimental methodology and (b) to use a feedback task which would unquestionably show the influences of hypnosis by removing related confounds, i.e., relaxation. For the latter reason lowering dermal temperature was selected. As was stated, "Lowering temperature involves the activation of physiological systems which are the antithesis of the apparent physical state in a hypnotic trance. If hypnosis is more than a state of physical relaxation, performance on this task may be potentiated by hypnosis. If relaxation were significant, then subjects under hypnosis would not be able to perform the selected task..." (p. 856).

Statistical comparison of the control and experimental groups showed a significant mean increase in peripheral temperature for the non-hypnotized group, while the hypnotized group maintained lower mean dermal temperature over all trials.

In his critique of this study, Edmonston (1) asserts an alternative explanation for these results based on a relaxation perspective. In his own words, "... the hypnosis group maintained their degree of relaxation, while the non-hypnosis group relinquished what relaxation they had achieved during the preliminaries" (p. 3). Edmonston further elaborates on the relatively flat temperature recordings for the hypnotized group as reflective of a "relaxation response" characteristic of a "neutral" hypnotic state (5, p. 859).

This interpretation becomes untenable if the physiological consequences of relaxation are taken into account. Relaxation effects dilation of the capillary system which produces increases in dermal temperature. The deeper the relaxation, the greater the temperature increase. If relaxation were such a critical part of hypnosis and the experi-

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mental group were as deeply hypnotized as Edmonston concedes, why then did the hypnotized group maintain lower dermal temperatures throughout all recorded phases than the nonhypnotized group (which supposedly did not maintain a state of relaxation)?

Edmonston briefly notes the increases in temperature recorded by the non-hypnotized group and appears surprised by these increases. The fact is that the lowering of dermal temperature is a difficult task for subjects to accomplish under many conditions. It involves the activation of delicate, complex physiological systems, which to be brought under voluntary control, necessitate the investment of careful concentration as well as particular cognitive strategies. The difficulty of successfully accomplishing this task as well as the extent to which its performance was facilitated by hypnosis was demonstrated by the results of the study questioned.

Without attempting to accommodate the results of the non-hypnotized group, Edmonston asserts that the findings of the hypnotized group are just the fluctuations in temperature usually recorded during a 'neutral' hypnotic state, i.e., the state of hypnosis before any type of suggestion is given. However, the recorded temperatures for the hypnotized group were taken while individuals were actively involved in the performance of a difficult cognitive-sensory task. The results are but the reflection of subjects' relative success in performing the task not changes in baseline temperature.

Selection of lowering peripheral skin temperature as the feedback task was done to make manifest the important role cognitive strategies play in the use of hypnosis to potentiate performance on specific tasks. The importance of cognitions and cognitive strategies have been evidenced in many previous studies (2, 3, 4, 6).

The study was designed to remove the confound of relaxation from interpretation of data on hypnosis and put forth a more viable perspective on the processes involved in hypnosis which centers on a cognitive drive system. Edmonston's critique of this study is useful in calling for more detailed and systematic approaches to research on hypnosis. His call for more elaborate experimental investigations of this issue can only be applauded. It is the belief of this author that research will serve to validate further the conclusions now questioned.

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