Electrodermal Fluctuation as a Function of Verbal Incentive

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This study was to determine if verbal incentive is an effective variable in the development of the control of electrodermal fluctuations (EDFs); and if body movement and respiratory artifacts are confounding variables in the feedback control of EDFs. Nonlabiles encouraged to increase EDFs by "thinking emotional thoughts" demonstrated significant increases in both EDFs and body movement and respiratory artifacts. However, persons with few, if any, artifacts showed an almost identical pattern of EDFs as compared to persons with relatively more artifacts in their recordings. Incentive as compared to control groups reported an increased ability to sustain their thinking about emotional events. All groups indicated decreased anxiety from pre- to post-feedback conditions. The findings were related to contemporary theory on cognition.

The purpose of this study was to determine if verbal incentive is an effective variable in the development of the control of electrodermal fluctuations (EDFs) and if body and respiratory artifacts are confounding variables of EDF analysis.

Interest in the electrodermal system and the control of EDFs appears to be greatly diminished in the past decade. The reasons for this may be because of the greater apparent medical and psychological value of research related to somatomotor and cardiovascular systems, and, possibly as well, because of problems and technical concerns of measurement (Fowles et al., 1981) and in obtaining consistent results with electrodermal responses. In an early review, Shapiro (1977) noted some inconsistencies of results and also the problems of teasing out the subtleties of autonomic and somatic interactions.

However, even given these concerns, research on the control of the electrodermal system would seem particularly important to contemporary research on cognition. With the greater attention now given to the control of cognitive processes (e.g., Pennebaker, 1989; Wegner & Schneider, 1989), to cognition and stress (Lazarus, 1984), to cognition and depression/suicide (Baumeister, 1990), to perceived self control and self-efficacy as cognitive mediators of stress (Litt, 1988), and to electrodermal lability and information processing (Wilson & Graham, 1989), a reminder of the research topic of electrodermal control seems timely. In a past review and critical analysis of the role of cognition in electrodermal conditioning Grings (1973) stated the following:

...the electrodermal response is so sensitive to shifts of attention and the momentary changes in arousal which accompany changes in cognition that it is
impossible to eliminate cognitive factors completely from conditioning observational situations. At the same time, this sensitivity gives the electrodermal response an advantage when it comes to direct study of cognitive variables. (p. 200)

These comments appear relevant to present day issues.

In our prior unpublished research replicating and expanding the efforts of others (e.g., as reviewed by Shapiro 1977), and particularly on research related to the cognitive control of EDFs (Klinge, 1972), we obtained findings in support of the development of the cognitive control of EDFs. The present research extends the study of the cognitive control of EDFs to verbal incentive conditions. This study is also an effort to examine potentially confounding bodily movement and respiratory artifacts of EDF recording. As proposed in the present study, a possible means of controlling for bodily artifacts is to examine EDF feedback changes relative to a body movement control condition. Presumably, if control of EDFs corresponds to changes in bodily responses, then, enhanced EDFs would be associated with increases, and reduced EDFs with decreases, of these artifacts of recording. If artifacts account for EDFs, persons instructed to increase EDFs by thinking “emotional thoughts” would be predicted to demonstrate more EDFs and artifacts than persons simply instructed to “sit more quietly.” Furthermore, persons instructed to decrease EDFs by thinking “relaxing thoughts” would be predicted to demonstrate more EDFs and artifacts than persons simply instructed to “sit more quietly.” Persons instructed to decrease EDFs would seemingly be slower to discover that they could do so by simply sitting more quietly than persons instructed to sit more quietly at the onset. This design and type of control condition would seem to maximize possible differences between groups in movement artifacts as confounding variables in the interpretation of the control of EDFs.

A second variable of concern is that of individual differences in EDF lability. From research on the effects of initial levels on subsequent response measures, the possible confounding of EDF control and body artifacts may be more pronounced among selected persons. Seemingly, increases of EDFs and artifacts would be more easily demonstrated among persons who show low-resting levels of EDFs (nonlabiles). On the other hand, decreases of EDFs and artifacts would be more easily demonstrated among persons already showing high levels of EDFs (labiles).

Thus, in the present study, nonlabiles encouraged to increase EDFs by “thinking emotional thoughts” were predicted to demonstrate more EDFs and artifacts as compared to a nonlabile control group. And labiles encouraged to decrease EDFs by “thinking relaxing thoughts” were predicted to demonstrate more EDFs and artifacts than a labile control group. Unconfounded comparisons are possible between the verbal incentive conditions and their respective controls.