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INDIVIDUAL DIFFERENCES IN THE PHYSIOLOGICAL DETECTION OF DECEPTION

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I certify that the work embodied in this thesis is the result of original research and has not been and is not being submitted for any other degree. I certify that all sources used in preparing this thesis have been acknowledged.

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ABSTRACT

The research programme reported here was concerned with the relationship between individual differences in electrodermal activity and the ability to detect deception from measures of differential responsiveness within the electrodermal system. A review of the literature indicated that three dimensions of electrodermal activity might exist and be of relevance to detectability: absolute reactivity of the electrodermal system, relative reactivity or specificity of the system in relation to other response systems, and the degree of change within the system or its lability. The programme therefore involved the measurement of these three aspects, the study of their dimensionality, the development of indices of detectability, and the study of the predictive power of the dimensions in relation to detectability. The relationship of these several measures to scores on self report tests of personality (the superfactors of extraversion, neuroticism, psychoticism, and a measure of socialization) was also pursued.

The measures of electrodermal activity were derived from recordings in four stimulus situations: relaxing without task demands, listening to tones presented at brief intervals, performing mental arithmetic, and listening to a count-up during which an aversive stimulus, a white noise burst, was expected. The indices of detectability were derived from recordings during a card test in which the subject was questioned about which of six cards had previously been selected and from a mock agent procedure in which the subject role-played an espionage agent with code words which were not to be divulged.

A total of 210 undergraduate male and female students participated in the research programme, but data from five of these was lost due to technical problems. All subjects participated in the tests for electrodermal responsiveness, and 121 took part in the card test and 84 in the mock agent procedure. In conducting the card test a number of variations were introduced to test for the importance of the nature of the subject's response during interrogation and the importance of card selection. In the mock agent procedure, both a control question test and a guilty knowledge test were employed in questioning.

Results of the analysis of measures of electrodermal activity indicated that dimensions of absolute reactivity and lability could be identified in the pattern of intercorrelations, but that a separate dimension of relative reactivity or specificity could not be isolated. Results of the attempt to develop measures of detectability indicated that the indices derived were broadly comparable with those used by other workers in terms of the accuracy of detection afforded, but that all lacked satisfactory levels of reliability. As a consequence, the intercorrelations of the responiveness and detectability indices were low. Significant correlations did emerge with some frequency in the case of measures of lability and these correlations were shown to be independent of the dimension of reactivity and specific to differential responsiveness under conditions of deception. Few significant correlations with the self report measures of personality were obtained at any stage of the programme.

On the basis of the research programme and the literature review it is concluded that attentional factors reflected in electrodermal lability underlie individual differences in detectability using electrodermal measures in typical laboratory tests of deception. In particular, subjects who maintain orienting responses to stimuli because they attribute significance to these events are more likely to be detected using electrodermal measures. Individual differences in systemic reactivity are far less important. Before further work is conducted on the question of individual differences in detectability, however, the issue of the reliability of these measures should be systematically addressed.

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List of Abbreviations

AL	Autonomic lability
ALS	Autonomic lability score
ATS	Autonomic tension score
CPI	California personality inventory
CQ	Control question
DBP	Diastolic blood pressure
DETCA	Detectability index derived for this study (see Table 5.13)
DIFRA	Differential response index derived for this study (see Table 5.13)
DR	Defensive reflex
E	Extraversion
EKG	Electrocardiograph
EPI	Eysenck Personality Inventory
EPQ	Eysenck Personality Questionnaire
Es	Ego strength
FPA	Finger pulse amplitude
GKT	Guilty knowledge test
HR	Heart rate
IRS	Individual response specificity
IRSSCB	Specificity index derived for this study (see page 71)
MMPI	Minnesota Multiphasic Personality Inventory
N	Neuroticism
NSRs	Non-specific responses
OR	Orienting reflex
P	Psychoticism
Pd	Psychopathic deviate scale of the MMPI
PDD	Psychophysiological detection of deception
POT	Peak-of-tension
PP	Pulse pressure
PSRSQ	Perceived Somatic Reactions Questionnaire
RR	Respiration rate
SBP	Systolic blood pressure
SC	Skin conductance
SCAMP	Skin conductance amplitude index derived for this study (see page 72)

SCBL	Skin conductance base level index derived for this study (see page 72)
SCR	Skin conductance response
So	Socialization scale of the CPI
SP	Skin potential
SPR	Skin potential response
SR	Skin resistance
SRR	Skin resistance response
TNR	Total number of stimulus-evoked responses
VHR	Variability of heart rate