

This Week's Citation Classic®

Lykken D T & Venables P H. Direct measurement of skin conductance: a proposal for standardization. *Psychophysiology* 8:656-72, 1971.
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A standard method of measuring electrodermal levels (EDLs) and responses (EDRs) is described, including electrodes and signal conditioners. The problem of units of measurement is considered together with methods for correcting EDLs and EDRs for individual differences in their respective ranges of variation. [The SSC¹® indicates that this paper has been cited in more than 180 publications.]

Palmar Sweating: Its Measurement and Meaning

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The electrical conductance of the thick skin of the palms and soles varies dynamically with psychological arousal. Discrete stimuli elicit wave-like increases in skin conductance; the size of these electrodermal responses (EDRs) varies with stimulus intensity or, more interestingly, with the psychological impact of the stimulus. Thus, for example, EDRs measured from the rat's foot pads were used to show that painful electric shocks have less impact when they are predictable in time,¹ a finding later confirmed with human subjects,² thus demonstrating that the animal experiment had been unnecessary.

Electrodermal phenomena are caused principally by sudomotor activity in the eccrine sweat glands that thickly populate the volar skin and serve to keep it moist, adhesive, and resistant to abrasion. In man, raising one arm above the head increases sweating and electrical conductance in the elevated hand, a reflex that may have prepared our primate

ancestors for brachiation. Almost any significant stimulus will elicit an EDR, including internal stimuli such as an emotional response or an association of ideas, and it is believed that the EDR is part of an orienting mechanism that prepares the organism for action. Since its discovery a hundred years ago, the EDR has been used in hundreds of research studies and, as we said in 1971, "continues stoutly to provide useful data in spite of being frequently abused by measurement techniques which range from the arbitrary to the positively weird."

In 1968-1969 I was Peter Venables's guest at Birkbeck College in London, where I was spending a sabbatical leave, hoping to discover why he and I had obtained opposite results in electrodermal studies in schizophrenics.^{3,4} While that specific question, alas, was never fully answered, methodological differences were implicated. The detailed mechanism of the EDR was not well understood in 1969, yet Venables and I agreed that enough was known for us to promulgate a standard method of measurement and certain principles of interpretation. I drafted the article after returning to Minnesota, and the wide adoption of our proposals suggests that we were right in thinking that the time was ripe for standardization. Much has been learned about the EDR since 1971 (e.g., references 5 and 6), and a more official methodological prescription has been published.⁷ Rereading the 1971 paper, however, I was happy to note that it is still as clear and accurate a treatment as any available. It is gratifying to think that our paper has helped protect electrodermal phenomena from mensurational abuse for nearly a generation.

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2. Lykken D T, Tellegen A & Macindoe L. Preception: autonomic response to shock as a function of predictability in time and locus. *Psychophysiology* 9:318-33, 1972. (Cited 20 times.)
3. Lykken D T & Maley M. Autonomic versus cortical arousal in schizophrenics and non-psychotics. *J. Psychiat. Res.* 6:21-32, 1968. (Cited 10 times.)
4. Venables P H. The relationship between level of skin potential and fusion of paired light flashes in schizophrenic and normal subjects. *J. Psychiat. Res.* 1:279-88, 1963. (Cited 55 times.)
5. Edelberg R. Electrical activity of the skin. (Greenfield N S & Sternbach R A, eds.) *Handbook of psychophysiology*. New York: Holt, Rinehart and Winston, 1972. p. 367-418.
6. Fowles D C. The eccrine system and electrodermal activity. (Coles M, Donchin E & Porges S, eds.) *Psychophysiology*. New York: Guilford, 1986. p. 51-96. (Cited 5 times.)
7. Fowles D C, Christie M J, Edelberg R, Grings W W, Lykken D T & Venables P H. Committee report: publication recommendations for electrodermal measurements. *Psychophysiology* 18:232-9, 1981. (Cited 45 times.)

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