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Title: The Psychophysiology of Detecting Lies: More Problems

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Abstract. This article describes a recent study that illustrates the complexity of empirically validating the psychophysiological detection of deception.

Most scientific psychologists believe that the validity of the psychophysiological approach to detecting deception--the so-called polygraph or lie detector--has not been adequately demonstrated. To these psychologists, validity denotes that an assessment device indeed measures what it's supposed to measure--here, the phenomenon of deception.

In contrast, many practitioners of polygraphy believe that validity is very high with very low false positive and false negative rates. Often they attribute documented failings of polygraphy to problems with or mistakes of the polygraphy examiner--the human element, not the lie detection apparatus.

A number of factors contribute to such a divergence of views. Only four will be mentioned here. (1) The phenomenon of deception or lying is complex. One may lie to others. One may lie to oneself, thereby creating the result of lying to others, if not the actual process. The same may apply not to lying at all but to various phenomena of dissociation. One has different levels of awareness at different moments about different aspects of what one is being asked. Other concurrent and epiphenomenal psychological phenomena may at least partially share similar physiological substrates or features or mask those of deception with yet other substrates and features. (2) The social reinforcement contingencies are radically different for scientific psychologists and polygraphy practitioners. The former can relatively easily "get funding" (albeit from different sources) and "get published" (albeit in different journals) regardless of findings as long as the research has adhered to generally accepted strategies of scientific method. The latter necessarily endanger their livelihood and professional identity by finding polygraphy to be invalid--unless they also develop some "better way." This social fact does not suggest that the latter would purposely distort results any more than representatives of other professional groups in the same circumstances. However, the history of science and professional practice does suggest that social reinforcement contingencies similar to those of polygraphers are correlated with "misperceptions" of results at a level above chance. (3) Social psychological phenomena as diverse as demand expectations, self-fulfilling prophecies, nonspecific factors, interview and interrogation strategies and tactics, and the "bogus pipeline" belief--the person being polygraphed believing that the polygraph is infallible--often suggest that what is being assessed may not be deception at all. (4) Even when using each polygraphed person as their own experimental control, various personality types and prior experiences can befuddle the quest for truth of the polygrapher depending on the nature of the truth being sought.

A recent study on patterns of regional brain activity correlated with variants of anxiety underlines the plight of the psychophysiological detector of a psychological state: data can be collected supporting the hypothesis that two kinds of anxiety--anxious apprehension (e.g., worry) and anxious arousal (e.g., panic)--"look different" psychophysiologically, especially neurophysiologically. Depending on the social situation, panic seems to be correlated with a larger asymmetry of activity in the left cerebral hemisphere and a selective increase in right parietal lobe activity. Panic also seems to be correlated with

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different somatic symptoms--more significant changes in heart rate, skin temperature, and frontalis electromyographic activity.

As there are different kinds of anxiety, so there are different kinds of deception. In fact, some phenomenologists posit that deception is an ongoing human intrapsychic phenomenon that varies in type, intensity, and frequency at any point in time. Both through empiricism and through reason, one might posit that the validity claims of most polygraphers manifest hubris, a loyalty oath to process and ideology more than to the truth. (See Furedy, J. J., & Heslegrave, R. J. (1988). Validity of the lie detector: A psychophysiological perspective. *Criminal Justice and Behavior*, 15, 219-246; Heller, W., Nitschke, J. B., Etienne, M. A., & Miller, G. A. (1997). Patterns of regional brain activity differentiate types of anxiety. *Journal of Abnormal Psychology*, 106, 376-385; Honts, C.R., & Kircher, J. C. (1994). Mental and physical countermeasures reduce the accuracy of polygraph tests. *Journal of Applied Psychology*, 79, 252-259; Iacono, W. G., & Lykken, D. T. (1997). The validity of the lie detector: Two surveys of scientific opinion. *Journal of Applied Psychology*, 82, 426-433; Lykken, D. T. (1988). Detection of guilty knowledge: A comment on Forman and McCauley. *Journal of Applied Psychology*, 73, 303-304; McCauley, C., & Forman, R. F. (1988). A review of the Office of Technology Assessment report on polygraph validity. *Basic and Applied Social Psychology*, 9, 73-84; Rosenfeld, J. P. (1995). Alternative views of Bashore and Rapp's (1993) alternatives to traditional polygraphy: A critique. *Psychological Bulletin*, 117, 159-166.) Steinbrook, R. (1992). The polygraph test: A flawed diagnostic method. *New England Journal of Medicine*, 327, 122-123.) (Keywords: Deception. Lie, Polygraphy, Truth.)