Detecting Deception

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Each year, people in police stations and even in their own offices are questioned about their involvement in criminal activity and workplace misconduct. The goal of the police investigator, polygraph examiner, and juries is to determine whether the statements given by these individuals are indeed true. To this end, a number of tests have been created to determine if an individual is telling the truth or lying. Often, these tests are accompanied by some physiological measure of heart rate, respiration, blood pressure, galvanic skin response, or brain wave patterns. Polygraph results are often highly publicized and widely reported in the media as evidence of a suspect's guilt or innocence.

Is there really a way to measure deception? Is our technology advanced enough that we are able to accurately identify every liar without falsely accusing innocents?

The symposium "The Physiological Detection of Deception: Where Are We and What Lies Ahead" focused on exactly these questions. Moderated by John Cacioppo, of The University of Chicago, four speakers addressed a different aspect of research related to the physiological detection of deception.

William Iocano, University of Minnesota, provided a great deal of background information about the different types of tests used to detect deception in his presentation on "The Scientific Basis of Polygraph Testing." In particular, he talked about two widely used tests. The Control Question Test (CQT) asks a participant or suspect both control questions and questions relevant to the issue at hand. The example of a control question might be "Have you ever told a lie to stay out of trouble?" The physiological measures associated with that question would be used as a baseline. A relevant question would be "Did you take the missing money?" If the physiological response to the control question is greater than the response to the relevant question, it would be said that the individual was telling the truth. If the physiological response to the relevant question was greater than to the control question, then the judgment would be that he or she was telling a lie.

Another method of questioning is the Guilty Knowledge Test, a multiple-choice test in which the incorrect alternatives serve as controls. In this test, one is judged to be innocent if the greatest physiological response is to the correct answer.

In discussing problems associated with these two tests, Iocano said that "they are biased against innocent people," and that the individual's "fear of the consequences" determines his or her performance. In addition, a plethora of information can be found on the Internet to augment one's control response. Engaging in mental arithmetic, curling toes, and biting one's tongue can all be used to camouflage

one's responses.

Iocano also identified some of the problems of field studies. First, the use of confessions "overestimates the accuracy of the detection devices." An individual is much more likely to confess after failing a detection test and being judged as lying than one would be to confess after passing a lie detector and being judged as truthful. In addition, polygraph examiners never learn about their mistakes. They only hear about cases in which their polygraph results substantiated other evidence.

Iocano concluded by strongly stating that polygraphs are given "to obtain admissions and confessions" and that there is "no compelling evidence to support the use of the CQT or polygraph."

ARE ERPS THE ANSWER?
John Allen, University of Arizona, discussed "The Promise and Limitations of ERPs for Assessing Deception." He began with a caveat: that ERPs (event-related potentials) are "a recognition assessment and might or might not indicate guilt."

"ERPs may be advantageous, however, because P3 wave amplitude waves tend to be large when an item is recognized, " said Allen.

COUNTERMEASURES
J. Peter Rosenfeld, Northwestern University, discussed "Countermeasures to P300 Amplitude-Based Guilty Knowledge Tests: Other Approaches." He described investigations that used the Guilty Knowledge Test to examine the use of different techniques to fool attempts to recognize deception. In one study, the use of mental arithmetic was found to be ineffective. Specifically, students who used the method of counting backward by seven were unable to beat the Guilty Knowledge Test.

But one method was found to be effective: Using the multiple-choice structure of the test to beat it. This was achieved by having student participants make irrelevant alternatives on the test into their own secret targets. This provided sufficiently large P300 waves to irrelevant answers, thus indicating the individual was innocent.

RETHINKING THE DETECTION OF DECEPTION
In "Rethinking the Physiological Detection of Deception," Tyler Lorig, The University of Chicago, outlined many of the problems of the current methods of physiological detection of deception. One was that signals are often prone to variations due to extraneous noise and the idiosyncrasies of the examiner-examinee interaction. These may result in physiological reactivity that is not specific to lying but may instead be attributable to embarrassment or anxiety.

One path of future research may be to utilize a true or false sentence completion paradigm coupled with the use of a thermoelectric cooler. The goal of such research would be to determine, through classical conditioning, whether it is possible that there is a physiological element that occurs only in deception.

Lorig proposed that instead of manipulating the psychological and measuring the physiological, for this field of research to be applicable, we must measure the physiological and to be able to infer the psychological. "If we get the science right, applications will follow," Lorig concluded.