



## Psychiatry & Behavioral Sciences Section – 2011

### **I27 Linguistic and Paralinguistic Markers of Lying: Science and the Market**

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The goals of this presentation are to present and discuss recent technology and research in speech and voice analysis as a means of detecting lies.

The presentation will impact the forensic science community by presenting the significant scientific challenges that must be met in order to develop a practical speech and voice analysis technology that can be used in forensic evaluations.

Longstanding folklore and scientific ambition encourages the belief that an intention to deceive is betrayed in physical expression during the act of deception. Although this belief spurred the development of the polygraph, the failures of such devices in the laboratory and the field are now well recognized and summarized in a report in 2003 by the National Research Council. Whether the motivation is scientific or practical, alternative instrumental methods have been sought for detecting implicit markers of deception. Apart from the durable scientific interest in human behavior, the potential is great for marketing a successful technology to detect deception, for use in settings that require safety and security, and those that depend on truthfulness whether the proceedings are formal and juridical, or informal and commercial. Among many measures of autonomic and voluntary movement, research and forensic practice has focused from time to time on speech acts. These projects aim to identify the physical effects of speech that are attributable to stable linguistic and personal characteristics and to distinguish these from instance-specific aspects of speech that hypothetically reflect direct consequences of an intention to deceive, or indirect consequences of mendacity in acoustic effects of arousal or affect secondary to intended deception. In this panel, two recent research projects to contrast scientific practices and standards of evidence with the practices and standards recommended for commercial products and their uses will be discussed. While prior research on the detection of stress, emotion, and deception from speech and language has shown only limited progress, this has not dampened enthusiasm for marketing of commercial devices that purport to detect these states to a variety of customers. For the major products currently on the market, independent studies to date have failed to verify their efficacy with a wide range of speech materials collected under various experimental conditions, ranging from laboratory studies with carefully controlled speech to mock crimes to speech produced under realistic levels of jeopardy. This literature will be reviewed and it will be discussed with regard to policy debates conducted among private manufacturers, elected officials and their staffers, academic researchers, and federal bureaucrats. It can hardly be surprising that scientific evaluations of nascent technologies can sometimes provide findings that run counter to the experience of early-adopters who are using the technology in the field. The discussion will also address this conflict by identifying causes of this dissonance, including the problem of approximating the field in the laboratory and then generalizing the laboratory to the field. The significant distinction that different standards of efficacy have on such debates will also be addressed. This issue will be discussed within the context of recent evaluations of voice stress analysis programs. Finally, the long-term potential of the speech modality in deception detection will be discussed, with a focus on the constraints imposed outside the laboratory and the problem of countermeasures.

#### **Lie, Detection, Speech**