

## PRELIMINARY SUMMARY

### A STUDY TESTING THE VALIDITY OF TRUSTER-PRO VOICE ANALYSIS TECHNOLOGY IN A CRIMINAL FIELD CONTEXT

By

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Subjects scheduled for criminal polygraph examinations conducted by a large Midwest state police agency, for crimes ranging from larceny to murder, gave permission to record their vocal responses to questions asked about the issue at examination. These recordings were used here to test the predictive validity of a new voice analysis technology created in Israel by Trustech Inc. Two polygraph examiners, one a trained voice stress analyst, created the voice recordings using digital audio tape (DAT) decks prior to collecting the physiological data and conducting the field polygraph examinations. The voice data of 100 subjects was selected from 296 consecutive polygraph examinations. Selection was based upon the existence of ground truth, i.e., the presence of specific details in the subject's (or another person's) subsequent confession, 25 truthful control subjects, 50 deceptive and 25 truthful subjects, were selected from the field polygraph examinations administered by the two polygraph examiners. Either the examinee or another person confessing to the crime at issue confirmed examinee status.

A trained voice analyst in Israel, Dr. Albert de Vries analyzed the voice recordings using the Trustech software and rendered decisions regarding each subject's status. Results show that when examiner training was not considered, and only a truthful/deceptive decision allowed, the voice analyst achieved an overall accuracy rate of 78% for truthful subjects and 61% for deceptive subjects ( $P(2, 1, N = 99) = 15.693, D < .000$ ). These results were contrasted with those of six trained polygraph examiners who blind scored the exam's physiological data. A US government trained examiner achieved the greatest degree of accuracy. And in this context achieved an overall accuracy rate of 51% for truthful subjects and 92% for deceptive subjects ( $P(2, 1, N = 90) = 20.627, D < .000$ ). Although the ability to detect deceptive subjects appeared impressive, it was achieved by labeling 49% of the truthful subjects as deceptive. A practice that may be acceptable in a security context, may have serious policy implications in many other settings.

When the voice analyst and the polygraph examiners were asked to render truthful/inconclusive/deceptive opinions, the data analysis showed that excluding inconclusive decisions, the **voice analyst achieved an accuracy rate of 89% for truthful subjects** and 64% for deceptive subjects ( $P(2, 1, N = 56) = 17.143, D < .000$ ). The government polygraph examiner achieved an accuracy rate of 83% for truthful subjects and 76% for deceptive subjects ( $P(2, 1, N = 77) = 23.326, D < .000$ ).

Further analysis showed that examiner training was an important and contributing factor. When the voice analyst rendered decisions on those examinations administered by the polygraph examiner with no voice training, there was no significant discrimination between truthful and deceptive subjects. The accuracy of the voice analyst's decisions for those subjects tested by the examiner with voice stress analysis training however, were notably different. When the voice analyst was asked to render only a truthful/deceptive opinion his accuracy rate was 81% for truthful subjects and 71% for deceptive subjects ( $P(2, 1, N = 77) = 20.715, D < .000$ ). When the voice analyst was asked to render a truthful, inconclusive or deceptive opinion, and the inconclusive decisions were excluded, the analyst achieved an accuracy rate of 89% for truthful subjects and 78% for deceptive subjects ( $P(2, 1, N = 77) = 19.684, D < .000$ ). For the same sample, the polygraph examiner making a truthful/deceptive opinion achieved a 49% accuracy rate for truthful decisions and again, a 92% rate of accuracy for deceptives ( $P(2, 1, N = 69) = 13.911, D < .000$ ). Excluding inconclusive decisions, in a truthful/inconclusive/deceptive decision making context, the polygraph examiner achieved a 56% rate of accuracy for truthful subjects and 88% for deceptive subjects ( $P(2, 1, N = 58) = 12.796, D < .000$ ).

**The voice analyst's decisions regarding the status of the 25 control subjects were notable.** When asked to render only a truthful/deceptive opinion the voice analyst accurately identified 84% of the truthful control subjects. **When asked to render a truthful, inconclusive or deceptive opinion, and the inconclusive decisions were excluded; the voice analyst then achieved a 100% rate of accuracy.** In a truthful/deceptive context, the polygraph examiner making decisions on 20 of the 25 control subjects, accurately identified 70% of

the control subjects status. When the polygraph examiner rendered a truthful, inconclusive or deceptive opinion, and the inconclusive decisions were excluded; a 79% rate of accuracy was achieved.

These results are comparable to those found in some field validity studies that have examined the psycho-physiological detection of deception (PDD). Moreover, they suggest, at least in a criminal interrogation context, that the Trustech technology may provide some benefits not realized through the use of the polygraph, that is, the accurate classification of subjects who are in fact truthful. Together, these results and the versatility of the Trustech voice analysis software, would strongly suggest that additional research is needed to explore this new and promising technology in multiple settings and to investigate the effects that training, and the use of various testing procedures may have in different contexts.