EyeDetect Research Summary

Converus Chief Scientist Dr. John Kircher, his team, and independent researchers have published 20 articles about the ocular-motor deception test (ODT), which began to be commercialized in 2014 as EyeDetect®.

Peer-reviewed Research (11)

1. Webb, Hacker, Osher, Cook, Woltz, Kristjansson & Kircher (2009) Eye Movements and Pupil Size Reveal Deception in Computer Administered Questionnaires. In Schmorrow, Estabrooke, & Grootjen (Eds.), Foundations of Augmented Cognition. Neuroergonomics and Operational Neuroscience (553-562). Berlin/Heidelberg: Springer-Verlag. LINK
   Conclusions: (1) Pupil diameter and reading behaviors are diagnostic of deception and (2) Ocular-motor measures may supplement or be an alternative to the polygraph or self-report measures.

2. Webb, Honts, Kircher, Bernhardt & and Cook (2009) Effectiveness of Pupil Diameter in a Probable-Lie Comparison Question Test for Deception. Legal and Criminal Psychology, 14(2), 279-292. (Requires Subscription) LINK
   Conclusions: (1) Pupil diameter is a significant predictor variable for deception and (2) Pupil diameter may be a possible replacement for the traditional relative blood pressure measure.

3. Kuhlman, Webb, Patnaik, Cook, Woltz, Hacker & Kircher (09/2011) Evoked Pupil Responses Habituate During an Oculomotor Test for Deception. Presented at the Society for Psychophysiological Research Convention, Boston. (abstract) LINK
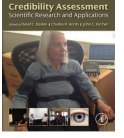   **Conclusions**: (1) Pupil reactions decrease in amplitude over repetitions of test questions (habituate) and (2) The diagnostic value of pupil reactions to different types of test items does not change over repetitions of test questions.

4. Cook, Hacker, Webb, Osher, Kristjansson, Woltz & Kircher (2012) Lyin' Eyes: Ocular-motor Measures of Reading Reveal Deception. Journal of Experimental Psychology: Applied, 18(3), 301-313. LINK
   Conclusions: (1) Reading behaviors may be used to detect deception and may supplement or provide an alternative to the polygraph or self-report measures in some field settings and (2) Relevant Comparison Test (RCT) accuracy is 85%.
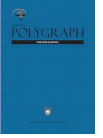
5. Hacker, Kuhlman, Kircher, Cook & Woltz (2014). Detecting Deception Using Ocular Metrics During Reading. In Raskin, Honts, & Kircher (Eds.), Credibility Assessment: Scientific Research and Applications. Elsevier, pp 159-216. (Requires Subscription) LINK
   Conclusions: (1) Ocular-motor tests for deception were 85% accurate in lab experiments and 78% accurate in a field study and (2) Ocular-motor tests were ineffective for participants with poor reading skills.

6. Patnaik, Woltz, Cook, Webb, Raskin & Kircher (March 2015) Ocular-motor Detection of Deception in Laboratory Settings. American Psychology & Law Society, San Diego, CA. LINK
   Conclusions: (1) Accuracy rates on cross-validation were about 80% for guilty and innocent groups in lab experiments using discriminant analysis and (2) Accuracy rates on cross-validation were about 84% for both groups using logistic regression analysis.

7. Kircher & Raskin (2016) Laboratory and Field Research on the Ocular-motor Deception Test. European Polygraph Journal, Volume 10, Number 4 (38). LINK
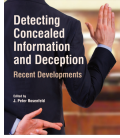   **Conclusions**: (1) Relevant Comparison Test (RCT) may contribute to pre-employment & periodic screening programs, particularly in government agencies concerned with law enforcement & national security; (2) Countermeasures are unlikely to affect outcomes; (3) Results generalize to US, Mexico, & Middle East populations and (4) the Relevant Comparison Test (RCT) accuracy is 86%.

8. Patnaik, Woltz, Hacker, Cook, Francke-Ramm, Webb & Kircher (2016) Generalizability of an Ocular-Motor Test for Deception to a Mexican Population. International Journal of Applied Psychology, 6(1): 1-9. LINK
   Conclusions: (1) RCT accuracy was 86% in a large sample of students at a Mexican university and (2) Effects of deception on ocular-motor measures were similar in Mexican and U.S. populations.

Peer-reviewed Research (cont.)

9. Kircher (2018) Ocular-motor Deception Test. In P. Rosenfeld (Ed.), Detecting Concealed Information and Deception (pp. 187–212), Elsevier Academic Press. (Subscription) LINK

   Conclusions: (1) Relevant Comparison Test (RCT) accuracy ranges from 80-86% and (2) Effects on ocular-motor measures are similar in lab and field settings.

10. Bovard, Kircher, Woltz, Hacker & Cook (2019) Effects of direct and indirect questions on the ocular-motor deception test. Polygraph & Forensic Credibility Assessment, 48(1), 40-59. LINK

    Conclusions: (1) Accuracy using direct questions is more significant (83%) than using indirect questions (60%) and (2) Accuracy improves when direct questions are asked using unpredictable transitions between question types rather than in blocks.

11. Handler & Nacházelová (2021) Hybrid Polygraph and Ocular-Motor Deception Tests for Screening and Specific-Incident Investigations. In Pracana & Wang (Eds.), Psychology Applications & Developments VII (pp. 80-92), inScience Press. LINK

    Conclusions: (1) Ocular-motor + polygraph testing yields 86 to 91% accuracy, (2) Ocular-motor deception test accuracy is between 85 and 87%, (3) Pulse transit time is diagnostic of deception and (4) Pupil reactions are more diagnostic of deception than traditional measures in automated polygraph examinations.

Independent or Other Research (9)

1. Osher (2006) Multimethod Assessment of Deception: Oculomotor Movement, Pupil Size, and Response Time Measures. (Doctoral dissertation), University of Utah, Dept. of Educational Psychology. LINK

   Conclusions: (1) A computerized method for deception detection using measures of pupil diameter, eye movement, and response times was evaluated and (2) Subjects were correctly classified as guilty and innocent with 82% accuracy.

2. Webb (2008) Effects of Motivation, and Item Difficulty on Oculomotor and Behavioral Measures of Deception. (Doctoral dissertation), University of Utah, Dept. of Educational Psychology. LINK

   Conclusions: (1) Guilty subjects took longer to respond, made more fixations, and did more reading and rereading when responding and (2) Subjects were correctly classified as innocent or guilty with 86% accuracy.

3. Patnaik (2013) Ocular-motor Methods for Detecting Deception: Direct Versus Indirect Interrogation. (Master's Thesis), University of Utah, Dept. of Educational Psychology. LINK

   Conclusions: (1) Subjects responding to direct questions were correctly classified with 89% accuracy and (2) Subjects responding to indirect questions were correctly classified with 69% accuracy.

4. Patnaik (2015) Oculomotor Methods for Detecting Deception: Effects of Practice Feedback and Blocking. Doctoral dissertation, University of Utah, Department of Educational Psychology. LINK

   Conclusions: (1) Subjects answering questions in block format (each question repeated four times in succession) were correctly classified with 83% accuracy and (2) Subjects answering questions in a distributed format (questions randomized) were correctly classified with 86%accuracy.

5. Potts (2020) 1, 2, 3 Crimes You're Out: Ocular-Motor Methods for Detecting Deception In a Multiple-Issue Screening Protocol. (Doctoral dissertation), University of Utah, Department of Educational Psychology. LINK

   Conclusions: (1) Multi-issue Comparison Test has greater practical utility than Relevant-Comparison Test (RCT), (2) Age and intelligence do not affect the diagnostic validity of behavioral or ocular-motor measures and (3) MCT accuracy is 88%.

6. Kircher (2021) EyeDetect Audio Multi-Issue Comparison Test (AMCT) Development and Validation Summary. LINK

   Conclusions: (1) Audio Multi-Issue Comparison Test (AMCT) is an ocular-motor deception test that presents questions audibly to subjects with reduced or no reading capability and (2) AMCT correctly classifies subjects with 85% accuracy.

7. Kircher (2021) EyeDetect Hybrid Directed Lie Comparison Test (HDLC) Development and Validation Summary. LINK

   Conclusions: (1) Hybrid Directed Lie Comparison (HDLC) test combines ocular-motor deception testing with polygraph, (2) Pulse Transit Time (PTT) components effectively replace the use of the blood pressure cuff and 3) HDLC accuracy is 89%.

8. Kircher (2021) EyeDetect Hybrid Multi-Issue Comparison Test (HMCT) Development and Validation Summary. LINK

   Conclusions: (1) Hybrid Multi-Issue Comparison (HMCT) test combines ocular-motor deception testing with polygraph, (2) Pulse Transit Time (PTT) components may replace the use of the blood pressure cuff and (3) HMCT accuracy is 91%.

9. Ambroziak, Smith & Mundt (2021) Ocular-motor Deception Testing in Civilly Detained Sexually Violent Persons: An Alternative to Post-Conviction Sex Offender Polygraph Testing? Applied Cognitive Psychology. LINK

   Conclusion: Results support the use of ODT methods with at least 80% accuracy as a potential alternative to post-conviction testing of sex offenders.