Criminal Investigative Techniques

Forensic Psychology
An Applied Approach

Christopher Cronin
Four Areas to be Covered

- Investigative Psychology – not quite the same as Forensic Psychology
  - Criminal Profiling
  - Detection of Deception
  - Hypnosis
  - Psychological Autopsies
Criminal Profiling

“Profiling is neither a readily identifiable nor a homogenous entity and its status is properly regarded as a professional sideline not amounting to a true science” (Gudjonsson & Copson, 1997).
Is Criminal Profiling for Real?

- Most criminal profilers are FBI agents, not psychologists.
- Number of criminal profiling jobs in the country is extremely small (fewer than 26).
- Few psychologists receive training in profiling, no graduate programs offer this training.
Current needs for Profiling

- Not appropriate for every crime

- Most appropriate for serial crimes
  - Arsonists
  - Serial bombers
  - Serial killers

- Three approaches to profiling
  - Historical
  - Common characteristics
  - Crime scene characteristics
Three approaches to profiling

- Historical
  - Review of historical/archival data

- Common characteristics
  - Constructing a descriptive profile of a crime classification

- Crime scene characteristics
  - Modus operandi
  - Criminal’s signature
Current Approaches to Profiling

- Crime scene analysis

- Criminal-profile generating process
  - Study of the nature of the crime
  - Analysis of the crime scene
  - Examination of background and activities of victims
  - Possible motivating factors
  - Description of the perpetrator
Crime scene analysis is used by criminal profilers to develop an offender description.
Evaluation of Profiling

- Effectiveness
  - May lock in to wrong profiles (examples include Olympic Park Bomber and DC Sniper)
  - 2.7% lead to identification of the offender
  - Poor research, small number of participants, small experimental effects
Detection of Deception

- Most popular form is the Polygraph

- Uses for the polygraph
  - Assess honesty of exculpatory statements given by suspects
  - Review status of employees whose work involves security matters
  - Assess behavior of probationers (sex offenders)
  - Child custody cases
  - Appeals
Criticisms of Polygraph Procedures

- British Psychological Society
  - Use of non-standardized procedures
  - Mislead subjects about test’s accuracy
  - Create anxiety in subjects to encourage confessions
  - Violate subject’s privacy
Procedures involved in Polygraph Testing

- Electrodes are used to record physiological changes during an interview.
- Measures such as heart rate, respiration rate, blood pressure, and galvanic skin response.
- Measures are recorded on graph paper or displayed digitally on a computer screen and stored electronically.
Sources of Inaccuracy in Testing

- Two potential sources of inaccuracy
  - Physiological measures do not directly measure dishonesty; rather need to infer lying from emotional reactivity
  - Difficulty of accurately measuring physiological activity and quantifying these measures into ‘truth’ or ‘deceptive’ responses
Quantifying Physiological Responses

- Use subjective judgments regarding differences in emotional reactivity to questions - can be minimized by using computer programs

- Difference score between reactions to the two types of questions

- Difference scores introduce additional error because the obtained score is less reliable than the scores it is based on due to the additional error introduced from each separate score
Techniques used in Testing

The Control Question Technique (CQT)

- Consists of approximately 10 questions
- Relevant questions deal with the question at hand (crime, security, etc) and control questions deal with possible past behaviors that may elicit emotional reactivity
Control Questions Technique

- Assumption is that relevant questions will generate more emotional reactivity than control questions.

- Control questions measure the person’s level of reactivity.

- Control questions must elicit lying, must be chosen carefully.

- Innocent will respond to both control and relevant questions with equal emotional reactivity.

- Guilty person will show more reactivity to relevant questions than control questions. Creating a difference score.
The Relevant-Irrelevant Test

- First most widely used procedure
- Mostly discarded by examiners due to false positives
- Relevant questions deal with issue at hand (crime, security, etc.)
- Irrelevant question is innocuous
The Relevant-Irrelevant Test

- Assumptions
  - Relevant questions will elicit emotional reactivity in guilty individuals and not in innocent people
  - Irrelevant question will not elicit emotional reactivity
  - Problem: relevant question can elicit emotional reactivity in innocent people
A Third Approach

- Use of questions related to the crime that only the guilty person would know along with misleading questions

- Misleading questions: questions about the crime which are fictional

- Assumption: guilty person will show heightened emotional reactivity to questions related to the crime than to misleading questions

- Innocent person will feel emotional reactivity to all questions
Research on the Validity of the Polygraph

- Two types of studies
  - Laboratory Studies and Field Studies
  - Laboratory Studies - asked college students to commit a crime and then lie about it
    - Advantage of knowing the ‘truth’
    - Lack ecological validity
Research on the Validity of the Polygraph

- Field Studies

  - Include a representative sample of polygraph tests administered under real-life conditions

  - Charts scored by independent polygraph examiners (blind scoring) - use of only the charts and no additional information

  - Compare score of polygraph to an independent criterion (some other determination of guilt or innocence)
Counter-Measures to the Polygraph

Physical and Mental Counter Measures

- **Physical**
  - Suppressing physiological responses
  - Augmenting physiological responses
  - Suppressing overall physical activity (sedatives)
How Effective are Physical Counter-measures?

- Can result in inconclusive results rather than truthful results
- Use of more than one counter measure simultaneously is more effective
- Training and practice is necessary
- Some physical counter-measures can be detected by the examiner; others may be missed
Mental Counter-Measures

- Artificially producing responses to control questions
- Attenuating responses to relevant questions
- Mental dissociation
  - Can not be detected by examiner
  - Less effective than physical measures
  - Most effective - think of emotionally arousing events during baseline questions
Is the Polygraph Effective?

- Training: certification, continuing education
- Techniques used
- Type of equipment
- Admissibility to court
Brain Activity and Deception

- Three techniques attempting to measure brain activity during deception:
  - Positron Emission Tomography (PET)
  - Magnetic Resonance Imaging (MRI)
  - EEG patterns: event-related potentials
Positron Emission Tomography

- PET scans detect concentration of radioactive substances, which were injected into the bloodstream, in regions of the brain.
- PET scans trace blood flow, which coincides with cellular activity.
- PET scans show areas of the brain active during particular activity (deception).
Magnetic Resonance Imaging

- MRI exposes brain to magnetic field and radio-frequency energy to measure hydrogen content (water) of body tissue
- Anatomical structures of brain
Functional MRI

- Combination of PET and MRI provides an ongoing picture of neuronal activity in the brain
- Shows promise in associating brain activity with emotions, deception, racial bias, etc
- Expensive and time-consuming
EEG and Event-related Potentials

- EEG - brain wave patterns
- Event-related potential - brain wave patterns to particular stimuli
- P300 – spike in brain wave activity that occurs with 300 milliseconds after recognizing an image
- Indication of decision-making process in the brain
P300 and Deception

- Brain fingerprinting – guilty-knowledge test
- Event-related potentials that occur after presentation of relevant information
- MERMER – memory and encoding-related multifaceted electroencephalographic response
- New area of research though based on established scientific principles (Daubert)
- Has been accepted in court
- Not without its critics
Other Measures of Deception

- Autonomic measures
  - Cardiac output
  - Myocardial contractility
  - Respiratory sinus arrhythmia
  - Thermography
    - Facial thermography
Other Measures of Deception

- Demeanor
  - Body movements
  - Eye gaze
  - Facial expressions
  - Posture
  - Sound of voice
- Facial Action Coding System
- Voice Stress Analysis
Hypnosis

- Hypnosis – an altered state of consciousness characterized by varying degrees of willingness to engage in changes in behavior or conscious experience, usually brought on by special techniques
Three Theories to Explain Hypnosis

- **Role theory** – hypnosis is a social role
- **State theory** – altered state of consciousness with specific change in experience
- **Dissociative theory** – combination of role and state theories; hypnotized subject makes an implicit agreement to surrender partial control of conscious experience
Forensic Uses of Hypnosis

- Refreshed memories – victims and/or witnesses
  - Open admissibility rule
  - Totality of the circumstances test
  - Per se exclusionary rule
Psychological Autopsies

- Psychological autopsy - determine the mode of death; typically distinguish whether the mode of death was an accident or suicide

- NASH classification: natural, accidental, suicidal, or homicidal

- Suicide
  - Self-infliction
  - Intention to die

- Status of expert testimony for psychological autopsies
Web Sites

- Academy of Behavioral Profiling
  - www.profiling.org

- American Polygraph Association
  - www.polygraph.org

- American Society of Clinical Hypnosis
  - www.asch.net