Assessing witness credibility: Is it possible to tell whether someone is lying or telling the truth?

Associate Professor Helen Paterson
helen.paterson@sydney.edu.au

THE UNIVERSITY OF
SYDNEY

Acknowledgement of Country

We acknowledge the tradition of custodianship and law of the Country on which the University of Sydney campuses stand. We pay our respects to those who have cared and continue to care for Country.

The Plan…

- Background

- Physiological indicators of deception

- Behavioural indicators of deception

- Content indicators of deception

- Difficulties in lie detection

Background

Eyewitness testimony:

- Can be critical to an investigation

- Is commonly used as evidence in court

- Can be very influential to factfinders

- But…

Some witnesses lie.

Definition of Deception

"A successful or unsuccessful deliberate attempt, without forewarning, to create in another a belief which the communicator considers to be untrue" (Vrij, 2000)

Types of Lies (DePaulo et al., 1996)

- Outright lies
- Exaggerations
- Subtle lies

Reasons to Lie

Other-oriented vs. Self-oriented

Frequency of Lying

American diary study: community members told 1 lie/day. Most lies were self-serving (DePaulo, 1996)

What do we know about liars?

LIARS

Are motivated to appear convincing

Tend to plan their verbal content more than truth-tellers

Tend to prepare more than truth-tellers

Three ways to catch a liar

I. Examine their physiological responses

II. Observe their verbal and nonverbal behaviour

III. Analyse the content of what they say

I. Examine their physiological responses

Polygraph: A Brief History

- 19th Century: Idea put forward by Lombroso, an Italian Criminologist
- Early 20th Century: Polygraph machine first used
  - 1917: William Marston claimed to detect lying by measuring systolic blood pressure
  - 1932: John A. Larson built a forerunner of the modern polygraph that measured pulse rate, blood pressure, and respiratory changes

Polygraph: Not a "Lie Detector"

- Polygraphs measure *physiological change*, not lies.
- **Assumption:** Telling a lie is more stressful than telling the truth

- Polygraphs measure:
  - ➢ Blood pressure
  - ➢ Heart rate
  - ➢ Respiration
  - ➢ Sweating (GSR)

Uses of Polygraph

- Helps in criminal investigations

- Verify a crime has occurred

- Pre-employment screening for security agencies and police

Polygraph Use Around the World

- Polygraphs used to be quite common in the US, but now mostly used for investigative purposes (Honts & Perry, 1992)

- In Australia, UK and most of Europe the polygraph is not used as part of formal legal process – but may still be used in some contexts including security services

- Polygraph has been prohibited from use in criminal investigations in NSW since the *Lie Detectors Act 1983* (NSW) was passed

Types of Polygraph Tests

- There are three main types of polygraph tests:
    1. Relevant/Irrelevant Test
    2. Control Question Test (CQT)
    3. Guilty Knowledge Test (GKT)

1. Relevant/Irrelevant Test

- Asks questions relevant to the crime and irrelevant to the crime
- Idea is that guilty people will respond more strongly when lying about the relevant questions
- Problem is that innocent person will know which are the relevant questions and will worry about their response to them... leads to many **False positive errors**
- No longer used in law enforcement, but may be used for employee screening (e.g., drug use, honesty)

1. Relevant/Irrelevant Test

- Asks questions relevant to the crime and irrelevant to the crime
- Idea is that guilty people will respond more strongly when lying about the relevant questions
- Problem is that innocent person will know which are the relevant questions and will worry about their response to them... leads to many **False positive errors**
- No longer used in law enforcement, but may be used for employee screening (e.g., drug use, honesty)

2. Control Question Test (CQT)

- Designed to overcome problems with the Relevant-Irrelevant Question test
- Includes three types of questions: **irrelevant, relevant, and control**

The CQT Process – Phase 1

- The CQT begins with a pre-test interview
- Yes/No questions are formulated and discussed with the suspect

    1. *Irrelevant questions:* No arousal

    2. *Relevant questions:* Discussed with suspect until they agree they are unambiguous. Should be stressful for guilty but not for innocent.

The CQT Process – Phase 1 cont.

3. ***Control questions:*** Related to issues involved in the case, but not the crime itself. Control questions are general, vague and cover long periods of time. Should embarrass both innocent and guilty. Questions require an honest "yes" response, but suspect is told they must lie and that the polygraph will detect this fact.

Control Question Test: Sample Questions

Irrelevant	Used to obtain a baseline.	Are you left handed?
Relevant	Deal with the crime.	Did you assault Sam Smith the evening of November 11th?
Control	Deal with prior behaviour. Designed to provoke anxiety.	Before age 25, did you ever verbally threaten to hurt anyone?

The CQT Process – Phase 2

- ***Stimulation Test:*** Idea is to convince suspect that the polygraph will be able to detect lies

- Often involves a card trick

- Designed to make the guilty more fearful and the innocent less fearful

The CQT Process – Phase 3

- Control, relevant, and irrelevant questions are asked several times over

The CQT Process – Phase 4

- Score using either:
    1. Global approach (subjective impression)
    2. Numerical scoring approach
        - If Relevant > Control = negative score
        - if Control > Relevant = positive score
        - All comparisons are summed to give a total score (often +5 = truth, –5 is deceptive. In-between = inconclusive)
- Sometimes a 5th phase is added– tell suspect the result in hope they will confess!

Criticisms of the CQT

- Formulation of control questions can be difficult
- Scoring is not sufficiently quantified
- Ethics? Strong element of deception
- How do we know that the suspect is "taken in" by the stim test?
- Why should innocent show stronger responses to control than relevant questions?
- Why should guilty show stronger response to relevant than control questions?

3. The Guilty Knowledge Test (GKT)

- The GKT (aka Concealed Knowledge Test) assesses if the suspect has information that only the criminal would know

- Asks suspects multiple choice questions, one option is correct

- Assumes if the suspect is guilty, they will react strongly to correct information

- An innocent person would not recognise the crime-relevant details and would therefore not respond

The GKT: An Example

- GKT could have been used in O.J. Simpson trial (Lykken, 1998).

- Could have asked immediately after body found (before press released info):
  - "You know Nicole was murdered. Was she Drowned? Hit on the head? Shot? Beaten? Stabbed? Strangled?"
  - "Where was her body found? In the living room? In the driveway? By the side gate? In the kitchen? In the bedroom? By the pool?

- Innocent has 1/6 of responding to correct info = 1/36 for both questions. More questions = better odds

GKT Precautions

- The examiner should be unaware of correct answer – suspect may "detect" correct answer from examiner

- Need to check that alternatives are equally arousing for innocent person

Limitations with the GKT

- Applicability: Cannot be used unless lots of details are known only to the perpetrator.

- Knowledge of perpetrator: Assumes that perpetrator knew or remembered details – may not be true

How Accurate Are Polygraph Tests?

- Accuracy of the CQT

- Majority of guilty suspects correctly identified
  - 84% to 92% guilty correctly identified

- Relatively large number of innocent suspects falsely identified as guilty (**false positives**)
  - 9% to 24% false positive errors

How Accurate Are Polygraph Tests?

- Accuracy of GKT
- Very accurate at identifying innocent participants
  - Around 95% correctly identified
- Less accurate at identifying guilty participants (**false negatives**)
  - Around 85% correctly identified

What Do the Experts Say?

Question	% Agree
CQT is based on scientifically sound theory	36
GKT is based on scientifically sound theory	77
Would advocate admitting a failed CQT as evidence in court	24
Conclude that an individual who fails 8/10 GKT items has guilty knowledge	72
CQT can be beaten by increased response to control questions	99

The University of Sydney

Source: Iacono & Lykken, 1997

Current Directions: Voice Stress Analysis

- Voice Stress Analysis (VSA)

- Advocates suggest that lying is considered more stressful, and this changes your voice

- Most research on this area has found results no greater than chance at being able to distinguish lying and truth telling (e.g., Damphousse, 2008; Hollien et al., 2008)

- *Lie Detectors Act 1983* (NSW) restricts use of VSA instruments

Current Directions: Brain-Based Lie Detection

- Recent research has investigated the use of electroencephalography (EEG) and brain scanning by means of functional magnetic resonance imaging (fMRI).

- The research has generated a lot of interest, but results of studies have not shown sufficient consistency to be admissible in court.

II. Observe their verbal and nonverbal behaviour

Behavioural Indicators of Deception

- Some verbal and nonverbal cues are more likely to occur during deception than others due to:

    1. Emotion

    2. Content complexity

    3. Attempted behavioural control

Behavioural Indicators of Deception

1. Paul Ekman's emotional approach:
   - Deception results in different emotions: guilt, fear, excitement *(duping delight)*
   - Strength of emotion depends on personality of liar and circumstances of lie
   - Emotions may influence the liar's NVB

Behavioural Indicators of Deception

2. Content complexity: lying can be difficult to do

    – People engaged in cognitively complex tasks exhibit different nonverbal behaviours

Behavioural Indicators of Deception

3. Liars may attempt to control their behaviour in order to avoid getting caught

    - When liars do this, they sometimes overcontrol themselves, resulting in behaviour that looks rehearsed and rigid, and speech that sounds too smooth
    - Nonverbal behaviour is more difficult to control than verbal behaviour

Behavioural Indicators of Deception: Verbal and Nonverbal Cues to Lying Meta-analyses by Sporer & Schwandt (2006; 2007)

Verbal cues:
1. Higher pitch of voice
2. Increased response latency
3. Increased errors in speech
4. Shorter length of description

Nonverbal Cues:
5. Decreased nodding
6. Decreased foot and leg movements
7. Decreased hand movements

Behavioural Indicators of Deception

- **Microexpressions:** A fleeting facial expression discordant with the expressed emotion and usually suppressed within 1/5 to 1/25 of a second

- It is difficult to control facial communication and it can betray a deceiver's true emotion to a trained observer (Ekman, 1992)

- Inconsistent emotional leakage occurred in 100% of participants at least once. Negative emotions were more difficult to falsify than happiness (Porter & ten Brinke, 2008)

Behavioural Indicators of Deception

- Liars do not seem to show signs of nervousness such as gaze aversion & fidgeting

- Professional lie detectors' ability to accurately classify truth and lies is about 55%

- Analyses of nonverbal behaviour are not accepted as evidence in criminal courts.

III. Analyse the content of what they say

Content Indicators of Deception

Statement Validity Assessment (SVA)

- Developed in Germany to determine the credibility of child witnesses' testimonies in trials for sexual offences

- Extended to adults and other types of cases

- SVA accepted in other European courts, but not UK courts. Opinion in US is divided.

- Has been presented in expert testimony in US, but main role in guiding police investigations and decisions of prosecutors

From: Vrij, 2005

Statement Validity Assessment

- Consists of three major elements:
    1. Semi-structured <u>interview</u>
    2. Criteria-based <u>content analysis</u> (CBCA) of transcribed version of statement given during the interview
    3. Evaluation of the CBCA outcome via a set of questions (<u>validity check-list</u>)

CBCA: The Content Analysis

- Based on the *"Undeutsch hypothesis"*:
  - ➤ A statement derived from memory of an actual experience differs in content and quality from a statement based on invention and fantasy (Undeutsch, 1987)
- Trained evaluators judge the presence or absence *(or strength)* of 19 criteria
- The presence of each criterion strengthens the hypothesis that the account is based on genuine experience

CBCA Criteria

- General Characteristics
  1. Logical structure
  2. Unstructured production
  3. Quantity of details
- Specific Contents
  4. Contextual embedding
  5. Descriptions of interactions
  6. Reproductions of conversation
  7. Unexpected complications during the incident
- Peculiarities of Content
  8. Unusual details
  9. Superfluous details
  10. Accurately reported details misunderstood
  11. Related external associations
  12. Accounts of subjective mental state
  13. Attribution of perpetrator's mental state

CBCA Criteria

    –   Motivation-Related Content

        14. Spontaneous corrections

        15. Admitting lack of memory

        16. Raising doubts about testimony

        17. Self-deprecation

        18. Pardoning the perpetrator

    –   Offence-Specific Elements

        19. Details characteristic of the offence

Why Are These Criteria Absent?

1. Lack of imagination in inventing relevant characteristics
2. Do not realise judgements based on these characteristics, so don't include them
3. Difficult/ lack knowledge to incorporate certain criteria
4. Wary of including details in case they forget
5. Wary of including details that can be checked
6. Wary of including certain characteristics in case their stories sound less credible

From Vrij (2000)

Validity Check List

- Finally, to standardise CBCA findings, evaluators consider alternative interpretations:

  » Psychological characteristics (age, verbal and social skills)

  » Interview characteristics (types of questioning)

  » Motivation to report

  » Investigative questions (consistency with other evidence)

Does SVA Work?

- Vrij (2005) reviewed first 37 experimental and field studies on CBCA

- Criterion 3 received the most support: in 80% of studies truth tellers included more details

- Criteria 4 and 6 also received strong support: in 69% of studies truth tellers included more contextual embedding and reproductions of conversation

Does SVA Work?

- In 92% of experimental studies, truth tellers received higher CBCA scores than liars

- For experimental studies, Vrij (2005) reported:

  » Overall accuracy of 55%-90%

  » Accuracy for truths of 53%-91%

  » Accuracy for lies of 35%-100%

- Truth bias: CBCA is "truth verifying method" not "lie-detection technique"

- The absence of criteria does not necessarily mean the statement is fabricated (Vrij, 2005)

Some Concerns About SVA

- No formal decision rules, profiles for truth or deception, or cut points

- Criteria should be given different weight (Sporer)

- Different types of lies (from subtle to outright) may yield different levels/kinds of characteristics

- SVA assessments are subjective and inter-rater reliability can be low, even after extensive training

- CBCA assessments of written statements are time-consuming & even training may not improve accuracy (Akehurst et al., 2004)

Accuracy Rates of Professional Lie Catchers

(Memon, Vrij, & Bull, 2003)

	Truth	Lie
Nonverbal Behaviour	55%	55%
CBCA	76%	68%

- Chance rate = 50%
- Nonverbal behaviour: Average scores of 9 studies (mostly lab studies)
- CBCA: Based on 13 lab studies

Difficulties in Detection of Deception

1. Lie detection is difficult and there is no give-away cue
2. Othello Error: Truth tellers may show similar behaviour to liars because they, too, may experience emotions, may have to think hard, or may have to control themselves.
3. Adequate comparisons between truth-telling and lie-telling are not made (e.g., small talk vs. interrogation).

Difficulties in Detection of Deception

4. Observers seem to have incorrect beliefs about how liars behave and people, including police officers, are taught wrong cues

5. Liars can use countermeasures (e.g., can train themselves to beat techniques).

6. Deception research is often conducted in university labs and the stakes aren't high enough. It's hard to establish ground truth in field studies.

Difficulties in Detection of Deception

7. The Brokaw hazard: Individual differences in emotional expression, vocal and body movement characteristics.

8. Individual differences in ability to control: Some people are 'natural liars', or have trained themselves to be very effective liars.

9. Cultural differences in nonverbal behaviour

Take Home Message

- The polygraph does not work reliably enough to be regarded as a 'lie detector'

- There are no perfect methods for deception detection using behavioural or content analysis indicators. There is no Pinocchio's nose!

- The rates at which people are able to detect lies are well below the legal standard of "beyond a reasonable doubt."

Any Questions?

Email: helen.paterson@sydney.edu.au