Do Lie-Detectors Work?

Summary

This report examines the use of lie-detectors in investigating crimes. The focus is mainly on the ‘polygraph’ type of lie-detector and two particular ways of using it, the relevant/irrelevant test and the guilty knowledge test. Other methods of lie-detection are also briefly mentioned. The research is mixed but overall lie-detectors do not seem to work, at least not reliably.

1: Introduction

Lie-detectors are often seen in TV and films about police work, and in some jurisdictions (e.g. the USA) they are used in real investigations (Vrij, 2000). In fiction the lie-detector is usually shown as a perfect way of getting at the truth, unless the suspect is an especially skilled liar, but does the fiction reflect reality? This report outlines some of the main lie-detection techniques that have been used in real life and addresses the question ‘do lie-detectors work?’ The main focus is on the ‘polygraph’, as that is the classic machine that most people have in mind when they think about a ‘lie-detector’.

2: What is a polygraph?

A polygraph (from the Greek ‘poly’ meaning many and ‘graph’ meaning writing) is a machine that displays the output of several different measurements at once, either on paper or on a computer screen. The output is often displayed in the form of lines for each measurement, with the line going higher as a measurement (for example, heart rate) increases and lower as the measurement decreases. A trained operator can read this output and use it to determine whether the suspect attached to the machine is lying or telling the truth (Bull, Baron, Gudjonsson, Hampson, Rippon and Vrij, 2004).
3: How do lie-detectors work?

Lie-detectors work by taking physiological measures that are related to lying. For example, liars are often worried that they will be caught out (especially if they are trying to get away with a crime) and this can make their heart rates go up, make them sweat, and make them breathe faster. Sensors measure these responses and the polygraph displays them to the trained operator. That is the theory, anyway (Bull et al., 2004). Section 4 of this report examines whether it works in practice. First, two types of ways that the lie-detector is used are outlined in Sections 3.1 and 3.2.

3.1: The relevant/irrelevant technique

In this technique, the suspect is asked a number of questions, some of which are relevant to the crime being investigated (e.g. ‘did you rob the bank?’) and some of which are irrelevant (e.g. ‘do you like cake?’). The suspect should tell the truth when answering the irrelevant questions, because they have no reason to lie, but they should when answering the relevant questions. If the polygraph shows no difference between the two types of question then the suspect was telling the truth all the time, but if they are different then they were lying about the relevant questions (Larson, 1932).

3.2: The guilty knowledge test

The guilty knowledge test is similar to the relevant/irrelevant technique but a bit more subtle. The suspect is asked about a number of different possibilities about the crime, only one of which is true. For example, they might be asked ‘Did you break in through the back door? Was it the front door? Did you get in through the basement?’ The suspect will say no to all of the questions, trying to convince the investigator that they didn’t break in at all, but they will be more nervous when lying about the real answer (Ben-Shakhar, Bar-Hillel and Kremnitzer, 2002). The sensors will pick this up and show it on the polygraph for the trained operator to see.

4: Do lie-detectors work?

There have not been any proper studies into the relevant/irrelevant technique, and most trained polygraph operators do not think it is useful (e.g. Saxe, 1994), so this technique is not discussed here. However, there have been two field studies on the guilty knowledge technique. These studies included both guilty and innocent suspects, so the lie-detector could be both right or wrong in deciding that they were lying or telling the truth. Table 1 shows the results of these studies.

<table>
<thead>
<tr>
<th>Study</th>
<th>Guilty suspects</th>
<th>Innocent suspects</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Right</td>
<td>Wrong</td>
</tr>
<tr>
<td>Elaad (1990)</td>
<td>42%</td>
<td>58%</td>
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Table 1: Results of two field studies into the guilty knowledge test
These results show that the guilty knowledge test was very good at correctly identifying that innocent suspects were telling the truth. However, in one of the studies it was more likely to be wrong than right that a guilty suspect was lying, and in the other it was more likely to be right than wrong, so the picture is mixed.

5: Other methods of lie detection

There are two other ways of using the polygraph to detect lies: the directed lie test and the control question test, but there is not space to cover those here. There are also other methods of lie-detection than the polygraph, including:

- Brain scanning
- Reading body language
- Analysing the way people speak
- Testing for stress in people’s voices

However, at present the research evidence does not suggest that any of these methods really works very well either (Bull et al., 2004).

6: Conclusion

Discovering if a suspect is lying or telling the truth in a criminal investigation is vitally important, and a number of different techniques and technologies have been used to try to do this task. The most well-known is the polygraph lie-detector and there are different ways of using it. However, some of them have not been properly tested and others have shown mixed results. Other techniques are also not foolproof, so at the moment there does not seem to be such a thing as a reliable ‘lie-detector’. The answer to this report’s main question of ‘do lie-detectors work’ is therefore ‘no, not really’.

References:


