

POLICING PROJECT FIVE-MINUTE PRIMERS: POLYGRAPHS

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The Policing Project’s biometrics blog series explores basic information on one of the more complex—and rapidly changing—areas of policing: the use of biometric technologies. In each of these blogs we will explore four questions about a particular type of biometric technology:

- How are police using this technology?
- How does the technology work?
- How accurate is the technology?
- Should the public be concerned?

In this two-part entry in our series, we turn to lie detectors—the “[holy grail](#)” of criminal investigation—a tool proponents say can differentiate between truth and deception, possibly meaning the difference between a solved crime and a cold case.

Lie detection has a [long and messy history](#). Many technologies have been employed over the centuries for the purpose of detecting deceit, but 1921 brought an apparent breakthrough with the invention of the [modern polygraph machine](#)—a device that despite its controversies is still used by many agencies today, [including the FBI](#).

While the 21st century has seen the advent of multiple [new lie detectors](#) (which we explore in depth in the second part of this article), the core principle of lie detectors remains unchanged: these devices, no matter how technologically advanced they are, cannot detect objective truth. Instead, they can only measure physical responses that possibly predict deception.

For this reason, critics contend that lie detectors are merely “[fear detectors](#),” and a multitude of concerns surround their use—from [false confessions](#), to [racial bias](#), to [wrongful convictions](#).

BIOMETRICS

LIE DETECTION PART I - POLYGRAPHS

HOW ARE POLICE USING POLYGRAPHS?

When polygraphs first arrived on the scene, they were met with enthusiasm by policing agencies but [general hostility from courts](#). Although the U.S. Supreme Court ruled, in 1922, in *Frye v. United States*, that lie detection was not “[a matter of common knowledge](#),” polygraphs were still allowed to be used as evidence until 1998, when the Supreme Court in *U.S. v. Scheffer* ruled that state and federal courts could ban them. Today many states [still allow polygraphs](#) to be used in court, though the stipulations for their use vary widely. In some states, admission of polygraph results is decided on a case-by-case basis.

That said, police still use polygraphs outside of courtrooms for several tasks, including [screening recruits](#), [interrogating suspects](#), and monitoring and guiding [treatment for sex offenders](#).

As investigative aids, polygraphs can be used during an interview to [generate leads](#): if a particular question generates a stress response, investigators might decide to dig further into the details around the question. Sometimes, police will ask a suspect to take a polygraph in order to [gauge the reaction](#), hoping to infer guilt or innocence based on the nature of the response. Other times, police have used lie detectors as leverage when trying to [obtain confessions](#). Since the Supreme Court has [generally upheld](#) the use of deceptive interrogation techniques, [nearly all states](#) still allow police to lie to suspects about [the results](#) of lie detector tests or [the presence](#) of them, in order to elicit a (sometimes false) confession.

HOW DO POLYGRAPHS WORK?

Before diving in to how these technologies work, it's important to note one thing they can't be used for: objective lie detection. There is no universal

[physiological indicator of lying](#), but there are physiological cues that can act as [possible predictors](#) of deception.

What then does a polygraph measure? Essentially, [anxiety](#). Polygraph examinations involve attaching a [number of sensors](#) to the interview subject to measure indicators such as respiration, blood pressure, and galvanic skin response (similar to sweat). After the interviewee is connected to monitors, an investigator uses specific techniques, such as the [Control Question Technique](#), to generate a base line of anxiety. These questions are vague and somewhat difficult to answer truthfully (i.e., “Have you ever lied?” or “Have you ever stolen from a friend?”). The interviewee is told that answering the control question truthfully is as important as any other question, theoretically creating some measurable anxiety that will be similar to what would be detected if the interviewee lied.

Questions related to the crime being investigated are also asked (i.e., “Did you steal \$500 from your employer?”). This process continues, alternating between control questions and questions about the crime, with the test administrator recording and comparing the machine's readings. In theory, a change such as increased respiratory, sweat, or blood pressure response [could indicate deception](#). The entire process can take anywhere from [one to three hours](#).

In addition to or in place of polygraphs, some policing agencies engage in “[human lie detector](#)” training. Unlike polygraph technology, these strategies rely entirely on the interrogator's intuition. Human lie detector techniques claim to work similarly to polygraphs by first establishing a baseline response from an interviewee and then identifying their nonverbal cues that indicate dishonesty. However, like most lie detector methods, this technique has [scant scientific support](#).

HOW ACCURATE ARE POLYGRAPHS?

In 2003, the National Academy of Sciences published a [landmark report](#) that assessed polygraph accuracy across 57 studies. The report found that even though the polygraph machine performs above pure chance, evidence supporting the validity of the tests is “[scanty and scientifically weak](#).” A 2018 study concluded that the [quality of polygraph research](#) has changed little since 2003 and that the report’s conclusions remain relevant to polygraph research.

The NAS report also warned that the polygraph examiner’s own biases about race, age, and gender may influence how he or she interprets polygraph results. A 1990 study from the U.S. Department of Defense found that innocent Black interviewees were more likely to [receive false positives](#) from polygraph examinations than innocent white interviewees. More recently, in 2018, WIRED [filed public records requests](#) with law enforcement agencies who use polygraphs when screening new employees to determine whether demographic data correlates with polygraph failure. While many agencies failed to provide their data, the data that was made available suggested that Black, Hispanic, and Native American candidates were consistently overrepresented among those who failed polygraphs, and younger candidates were hired at higher rates than older candidates.

Polygraphs results may also lead the investigator to make inaccurate conclusions about interviewees who have medical conditions. Interviewees with disorders that affect the [autonomic nervous system](#) may have irregular vital signs that the polygraph incorrectly associates with stress—which is then interpreted as a sign of deception. These conditions can include rheumatoid arthritis, diabetes, and alcohol use disorder. Additionally, many [commonly prescribed medications](#) for conditions including

congestive heart failure, hypertension, panic disorder, or post-traumatic stress disorder can cause changes in the vital signs that polygraphs measure.

There are also potential ways to [trick a polygraph](#), such as by taking drugs, altering your mental state (e.g. counting backwards, thinking of images, disassociating, hypnotism), or manipulating your physiological symptoms (e.g. biting your tongue, holding your breath, contracting your muscles).

Finally, it is worth noting there is a federal ban on the use of polygraphs by private employers and that the U.S. Supreme Court has stated that “there is [simply no consensus](#) that polygraph evidence is reliable.”

SHOULD THE PUBLIC BE CONCERNED ABOUT POLYGRAPHS?

One significant problem with lie detectors is that they have been [linked to false confessions](#), and as mentioned earlier, the U.S. Supreme Court has declared that police can deceive suspects in order to obtain a confession, including by lying about the results of lie detector tests.

False confessions have a significant impact on criminal cases, as it becomes significantly harder to convince a jury that a defendant who has confessed is innocent. The National Registry of Exonerations, which tracks every known exoneration in the United States since 1989, has found that in [19% of all exonerations](#) the person wrongfully convicted made a false confession or was implicated by a co-defendant’s false confession. This number increases to 34% for homicide exonerations.

Police often use the polygraph’s [post-test “failure”](#) feedback to pressure suspects into making a confession. [Juvenile](#) and [mentally ill](#) suspects are [particularly vulnerable](#) to making false confessions when placed into custody and interrogated. The National Registry of Exonerations has identified [65 cases across the U.S.](#) in which the defendant made

a false confession after some form of police deception. Currently, [only one state](#), Hawaii, forbids the police from lying about the results of a lie detector test.

Polygraphs are also widely used to [screen employees](#) in the public sector, though there is little research about this application. The vast majority of policing agencies in the U.S. require applicants to pass a polygraph test during their pre-screening background check, though there is [virtually no evidence](#) as to whether polygraphs are accurate when used for this purpose. As a result of this potential misuse and the accuracy issues identified above, qualified people [may not be hired](#) into public safety or law enforcement jobs. This combined with potential biases of polygraph examiners may mean polygraph screenings re-enforce discrimination against [people of color](#), [older applicants](#), or applicants with certain [medical issues](#).

In the [next installment](#) in this two-part series, we explore new and emerging lie detection technologies, including iris scanners and virtual policemen.

Explore More Five-Minute Biometrics Primers from the Policing Project:

- [Face Recognition](#)
- [Iris Recognition](#)
- [Rapid DNA](#)

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