

The Correlation between Behavioral Characteristics and Lie Detection

Grace Harper

Edited by: Michael Hernandez

Abstract

The accuracy of lie detection is a highly debated topic in the science community, and it has been determined that there are many conditions in which the “truth” simply cannot be determined (Saxe 1991). The purpose of this experiment was to decide whether the truthfulness or falsehood of the responses of a set of randomly selected test subjects could be determined by observation of their behavior. Based on prior knowledge, it was hypothesized that the truthfulness of the test subjects could not be determined based off analysis of their behavior. The experiment consisted of interviewing a group of test subjects in a series of two trials of the same questions, one that they would answer truthfully and one that they would answer untruthfully. The subjects chose which trial they told the truth and which they did not. Their behavior was observed for both trials, and the observations were recorded. The presence of certain common behavioral traits was graphed, and revealed that there were in fact patterns in the overall behavior that distinguished between true and false responses. It was concluded that for this group of subjects, certain behavioral characteristics, such as lack of eye contact or lack of emotions present, indicated that the subject was lying when answering questions.

Keywords: Lie detection, behavior analysis, polygraph, forensic psychology

The questions surrounding lying and deceit date back to the earliest humans, and for as long as humans have been deceiving each other, there have been attempts to detect this deceit. Humans have always tried to use interviews and interrogations to generate a response from someone they presume to be hiding something; but even today, the scientific community has not reached any definite conclusion on the topic of deciding between truth and falsehood (“Committee to Review...” 2003). Scientists have decided that even the most well-known methods of lie detection, such as polygraph tests, cannot be trusted, and that there are no means of true lie detection that do not deserve our skepticism (“The truth about...”2004). This topic is both extremely controversial and prevalent in modern forensic psychology. The purpose of this

experiment is to decide if it could be determined, based off a group of test subjects, if a group of subjects were telling the truth or not based off of their observed behavior while answering questions. It was hypothesized, based on prior knowledge of the unreliability of polygraphs and other lie detection methods, that there would not be any distinguishing characteristics between subjects answering honestly and dishonestly. The experiment should help demonstrate the correlation between certain involuntary behaviors and the responses given by the test subjects, and provide a preliminary basis for further research to be extrapolated from the conclusions reached.

Materials and Methods

Ten test subjects were interviewed to observe certain behavioral traits of each subject when they answered specific questions truthfully or untruthfully. The test subjects consisted of randomly selected college students. The interview consisted of asking each subject a series of fifteen questions, ranging from simple inquiries such as “How many hours do you sleep a night on average?” to questions requiring more in depth answers, such as “What is your earliest childhood memory?” or “How would you describe your relationship with your parents?” The fifteen questions were each asked twice, in a series of two trials. The subjects were requested to answer one trial truthfully and one trial untruthfully. The subjects were instructed not to mix up their truthful and untruthful answers amongst each trial to keep each trial consistent. However, although each trial was to remain consistent, the subjects did not have to answer truthfully or untruthfully for any specific trial, as they could select which trial they wanted to lie and which trial they wanted to tell the truth. The subjects selected this for themselves so as to eliminate any bias in the behavior observations conducted during the experiment. After the conclusion of both trials, the subjects indicated which trial they answered truthfully and which trial they answered untruthfully. The interviews ranged from approximately fifteen to thirty minutes, depending on how in depth each subject chose to answer each question or the time required to think of their answers. The interviews were conducted in a controlled environment of a study room, with only the interviewer and interviewee present in the room, so as to eliminate any outside influence or distractions. While the interview was conducted, observations regarding the test subject’s behavior were recorded. The behavioral traits recorded were organized into seven general

categories, for the displaying of data. The behavioral traits focused on during the experiment included eye contact, facial expressions, subconscious body movements, depth of answers (details given), amount of time required to formulate answers, hesitation when answering, and observed emotion when answering.

Results

The observations included detailed recordings of the behavioral characteristics of each individual for each trial. In regards to eye contact, it varied from subject to subject, but if the subject maintained eye contact for the majority of the interview, it was recorded as such. Some subjects did not make eye contact early in the interview, but gradually made more eye contact by the end, or vice versa. Some subjects made better eye contact when answering certain questions than other questions. Eye contact varied greatly amongst each trial and subject, but for the purpose of the data table below, it was simply recorded if eye contact was or was not maintained for the majority of the trial. Regarding facial expressions, the most prominent behavior traits observed included smiling or frowning, furrowing one’s

Test Subject	Eye Contact Maintained	Facial Expressions Observed	Body Movements Observed	Depth of Answers	Time Required to Formulate Answer	Hesitation or Confusion in Answers	Emotion Expressed
1	Yes	None	Rubbing two fingers together	Brief	Long time to think	Slight hesitation in answers	None
2	Yes	Squints eyes occasionally	None	Some details given	Quick answers	No	None
3	Yes	None	Messing with hair	Brief	Quick answers	No	Excitement, anger
4	No	None	Messing with fingers	Specific names & details	Quick answers	No	Laughter
5	Yes	Smiling	Shaking leg	Elaborate answers	Quick answers	No	Genuine happiness; excitement
6	No	None	None	Some Elaborate answers	Quick answers	No	Laughter
7	Yes	Smiling	Messing with hands, lips, & hair	Elaborate answers	Quick answers	No	Laughter (seems comfortable)
8	Yes	None	Messing with lips	Brief	Long time to think	No	Anger, laughter
9	Yes	Changes facial expression	None	Elaborate and explained	Quick answers	No	No
10	Yes	None	None	Elaborate, specific names	Quick answers	Hesitation in answering	No

Table 1: B

eyebrows, or squinting one's eyes while answering questions. Subconscious body movements being present refer to several various behaviors, namely rubbing fingers together, messing with hands, shaking legs, shuffling feet, messing with another object such as a pencil or hair tie, messing with

Test Subject	Eye Contact Maintained	Facial Expressions Observed	Body Movements Observed	Depth of Answers	Time Required to Formulate Answer	Hesitation or Confusion in Answers	Emotion Expressed
1	No	Smiling	Rubbing two fingers together	Brief	Repeated questions; long time to think	No	None
2	Yes (entire time)	Smiling (and trying not to smile)	None	Brief	Quick answers	No	None
3	No	None	Shuffling paper in hands	More detail given	Longer time required to answer	No	None
4	No	None	Messing with hair	Brief	Quick answers	"Choppy" answers	None
5	No	Furrows eyebrows, smiling	Shaking leg, messing with pencil	Brief	Quick answers	"Choppy" answers, some hesitation	None
6	No	Smiling	Drinking water	Elaborate answers	Quick answers	Rambles on answers	None
7	No	Smiling more	Messing with necklace	Brief	Quick answers	Long pauses	None
8	Yes	None	Messing with lip	More elaborate answers	Quick answers	No	Anger, laughter
9	No	Frowning, facial expressions	None	Brief	Long time to think	No	None
10	No	Changes expression a lot	None	Brief	Long time to think	Hesitates and corrects a lot	None

Table 2: Behavioral Traits Observed During Untruthful Responses

hair, drinking water, touching one's lips or nose, messing with one's necklace, etc. If no body movements were observed, the test subject sat still the whole time with hands regards to the depth of one's answers, it was recorded if subjects gave specific details, such as specific names, the time that an event occurred, or other specific details about their response. Regarding the amount of time it took subjects to answer questions, it ranged from one to two seconds, to one to two minutes, and it was recorded whether they answered quickly or took a long time to think of responses. Included in this, it was also observed if they repeated or rephrased the question while responding. The presence or absence in hesitation when answering or confusion of one's response (i.e. they had to correct themselves a lot or did not have their

story straight) was observed and recorded in the data table. Regarding the expression of emotion, if the subjects displayed what appeared to be genuine emotions when responding, it was recorded. The emotions expressed included laughter, sadness or solemnness, embarrassment, or anger. It is important to note that the graphs below do not show the specific behaviors of each category (i.e. graphs do not distinguish shaking one's leg versus playing with one's hair), but simply demonstrate the absence or presence of each behavior category for each subject in each trial. For example, in the graphs below, the presence of any one of the facial expressions previously mentioned implies that the behavior was exhibited during the trial.

Discussion

The practice of lie detection is a science that is constantly changing and being argued; however, although no definite laws exist for this area of forensic psychology, there were significant patterns displayed in the results of this experiment. Interpreting the graphs of the overall frequency of the specific behavioral traits in the ten test subjects allows for several patterns to be determined, and conjectures to be drawn to apply to the current knowledge on this subject. From the data, it can be determined that as a whole, when the subjects answered truthfully, eye contacted was better maintained, involuntary facial expressions and body movements were less prevalent, subjects responded in a shorter amount of time, and responses were more detailed, less hesitant, and appeared to have more emotions involved. In contrast, the untruthful responses of the subjects reveal that collectively, less eye contact was maintained, involuntary facial expressions and body movements were more frequent, and responses required more time to be

formulated and involved less emotions and greater hesitation.

detect deception, but rather detect fear (“The truth about...” 2004). Regardless, although

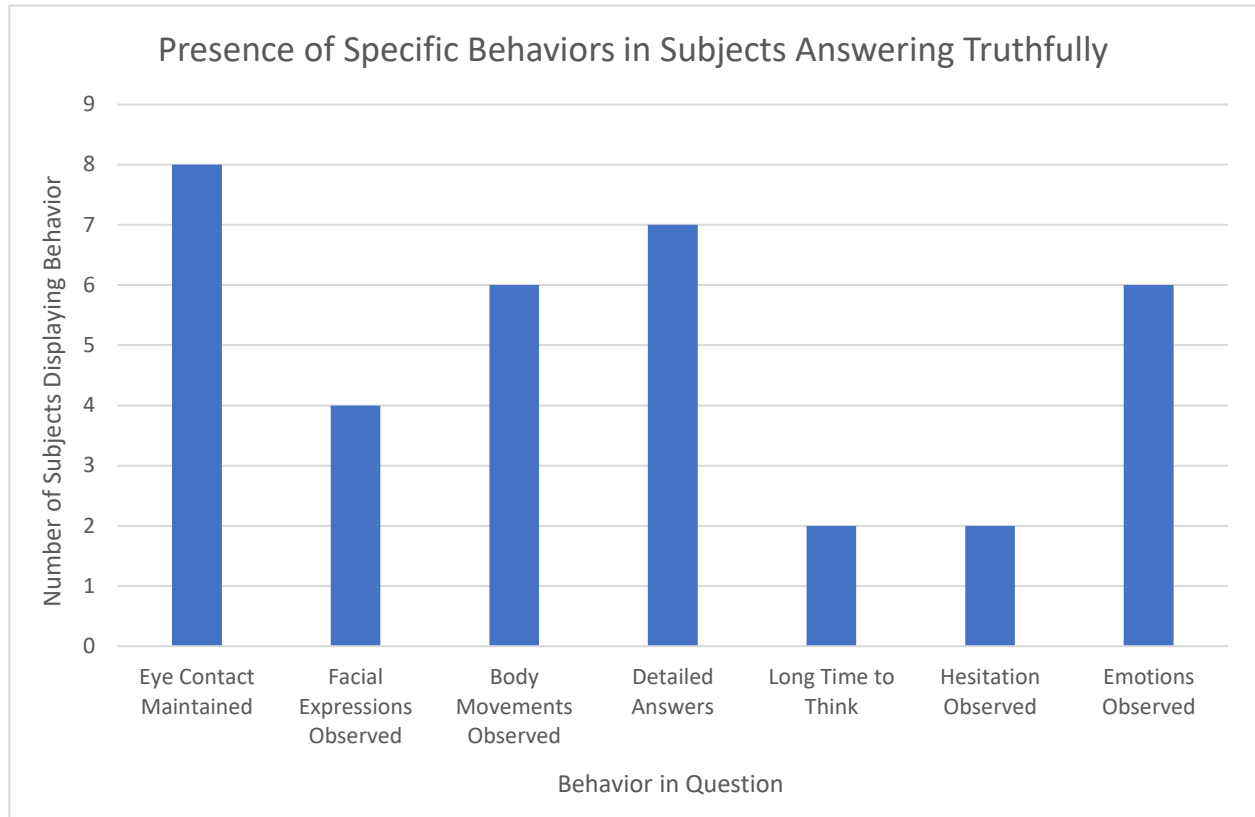


Fig 1. Presence of Specific Behaviors in Subjects Answering Truthfully

This experiment is important because it provides preliminary research that can potentially be built upon and applied to the knowledge currently held by the scientific community, to apply to extremely prevalent aspects of forensic psychology. For example, in a study conducted with sexual offenders, with offenses mainly directed towards adolescents, only 4.7% of the subject pool originally confessed to sexually abusing a child; however, when polygraph tactics were introduced, and additional 52.8% of the subjects admitted to the abuse they committed (Bourke 2015). Although polygraph evidence cannot be used to determine without a doubt one’s guilt or innocence, it can be seen that it did make a definite effect on the guilty subjects. As the American Psychological Association puts it, perhaps the tactics of a polygraph do not

the science of polygraphs is unreliable, there may be some select behaviors that can be further tested, that yield much more accurate conclusions. The experiment conducted provides preliminary data on a few specific character traits that are shown to accurately determine truth versus falsehood. This data could be further experimented on to attempt and define a set pattern that can ultimately be used in interrogations.

Despite the many potential opportunities for this research to be further extrapolated and beneficial to the forensic psychology community, there are several limitations of the data found during this experiment. For one, the subject pool only included ten test subjects, which cannot give an accurate behavioral frequency for an entire population. If this experiment was to

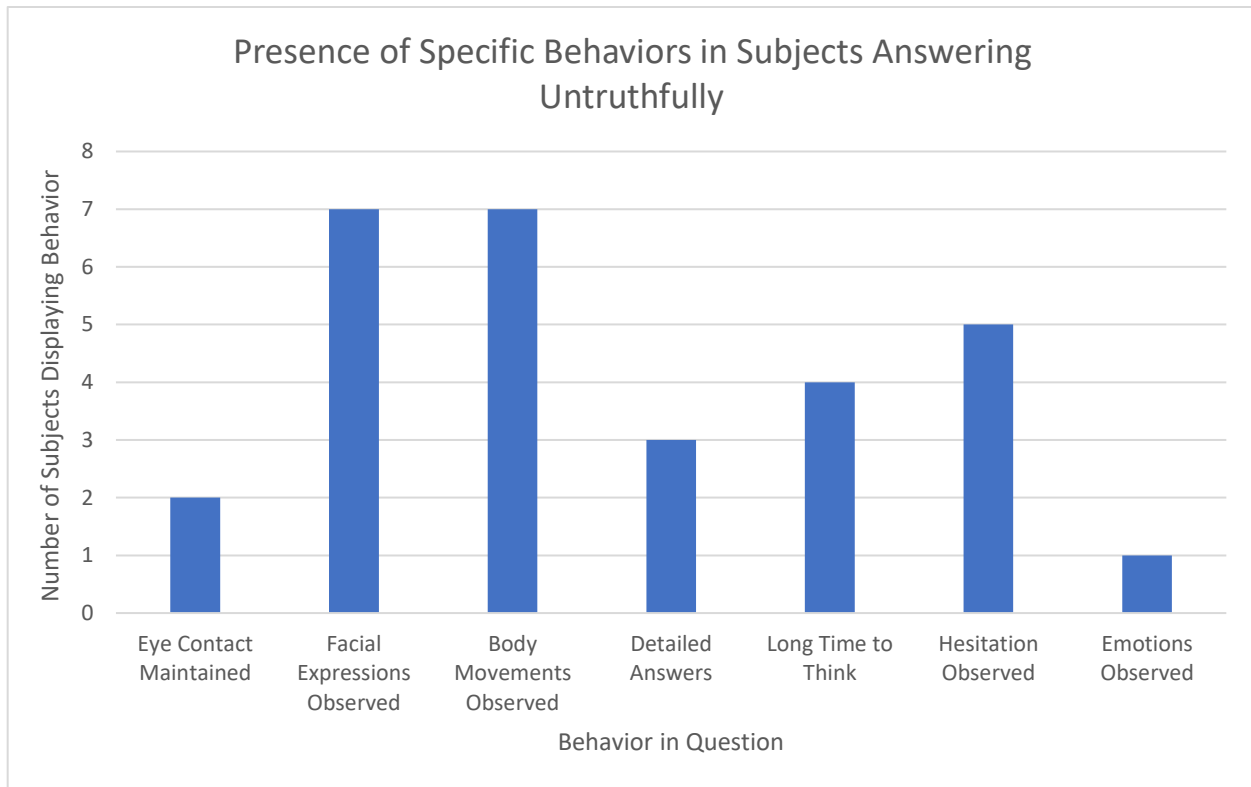


Fig 2. Presence of Specific Behaviors in Subjects Answering Untruthfully

be repeated in the future, a much larger subject pool should be used to see if the same type of results are yielded. Additionally, the behavioral patterns observed without a doubt provide a pattern for the subjects observed; however, this data is based off of normal, randomly selected individuals, who had no particular need to lie other than the fact that they were instructed to do so. These individuals did not prepare for the experiment in any way, or rehearse their responses beforehand. Their responses, behaviors, and reactions were genuine and unpracticed. However, in a situation of a criminal interrogation, the circumstances are entirely different. It is difficult to say that this research can be applied to a forensic situation in court, because the data and conclusions reached were based off of a small subject pool of, for the intents and purposes of this experiment, “normal” individuals. It would be problematic to attempt and apply this data based off of normal individuals to

individuals that are suspected of committing a crime, as the very nature of committing a crime goes against societal norms, and thus renders the guilty individual to be abnormal in some way. It is near impossible to claim that the behavioral patterns observed in this experiment can be applied to criminal interrogations, where potential psychopaths, who have tendencies of pathological and compulsive lying, are accustomed to situations that require their calmness when deceiving others. Pathological lying is not normal, so the behavioral analysis conducted on the normal test subjects is not necessarily applicable to a court of law or criminal interrogation (“Pathological lying...” 2013).

Despite these limitations, the experiment is beneficial, as it allows us to make conjectures regarding what could be further investigated on the subject. Perhaps a certain behavioral trait could be tested enough in the future to set a defined pattern. This experiment also relates to and

reinforces a similar study investigated by the Psychology Department of the University of Portsmouth, UK, which “investigated to what extent observers could make rapid yet reliable and valid judgments of the frequency of verbal and nonverbal behaviors of interviewees, and detect deceit after making these rapid judgments,” (Vrij 2004). The results of the experiment revealed that the rapid judgments made by the observers were valid and reliable, in fact, a 74% accuracy rate was found, which is well above the level of chance (Vrij 2004). In this experiment, behavioral cues were observed and immediately used as assumptions to determine the truthfulness of responses of set test subjects, and the assumptions yielded a high percentage of accuracy. These results coincide with the patterns

found in this experiment, that show a clear overall difference in each behavioral characteristic depending on the responses given.

Overall this experiment refuted the original hypothesis, in that a definite pattern for the overall behavioral characteristics of the subjects could be observed, and it could be concluded that presence or lacking of several specific characteristics could be used to determine between truthful answers and untruthful answers. The overall goal of the project was met, as it was established whether or not there was a pattern to the behavior of the test subjects, and it was determined that for this subject pool, behavioral analysis could in fact distinguish between honesty and falsehood.

References

- American Psychological Association. 2004. The truth about lie detectors (aka polygraph tests). <<http://www.apa.org/research/action/polygraph.aspx>>.
- Bourke, Michael L., L. Fragomeli, P. J. Detar, M. A. Sullivan, E. Meyle, and M. O’Riordan. 2015. The use of tactical polygraph with sex offenders. 21: 354-376
- Committee to Review the Scientific Evidence on the Polygraph, National Research Council (U.S.). 2003. The polygraph and lie detection. National Academies Press, Washington, D.C., United States.
- Healing Journey Administrator. 2013. Pathological lying: a psychopathic manipulation tool. <<https://www.psychopathfree.com/articles/pathological-lying-a-psychopathic-manipulation-tool.296/>>.
- Saxe, L. 1991. Lying: thoughts of an applied social psychologist. *American Psychologist*. 46(4): 409-415.

Vrij, Aldert, H. Evans, L. Akehurst, and S. Mann. 2004. Rapid judgements in assessing verbal and nonverbal cues: their potential for deception researchers and lie detection. *Appl. Cognit. Psychol.*, 18: 283-296