

Katelyn Regan

Abstract-

Studies state that when answering a question, humans resort to the truthful answer and then form a lie (Walczyk, 2014). Therefore, deception has a higher cognitive load than telling the truth (Walczyk, 2014). Deception, if undetected, can have various affects, many negative, on relationships. In this experiment, I wanted to see if the type of question: closed, open, probing, leading, loaded, funnel, recall & process, and rhetorical; affects the probability of deception being detected in adolescent females. To test this, I filmed one male and one female adolescent answering thirty-two questions (four questions per type) while flashing index cards with either “truth” or “lie” written on them. Afterwards this film was shown to twenty-five adolescent females who filled out a questionnaire asking “did participant one/two tell the truth or lie to question 1, 2, 3... and why” for each of the sixty-four filmed questions. I quantitatively analyzed by counting the amount of accurate deception and accurate truth detections for each question type. Qualitatively, I collected key phrases for the accurate truth and deception detections such as “participant one broke eye contact with the camera while responding.” I then calculated percent errors for each of the eight different types of questions to account for the fact that I could have told the filmed participants to lie to three of the four questions of a particular type rather than two of the four. These numbers were collected in data tables and then made into bar graphs with labels. The rhetorical questions had the lowest percentage of error followed by leading questions but due to the high percentage of errors, the results were inconclusive. In future studies, I would suggest that both the filmed and experimental groups include more participants to improve the accuracy of the results.

Introduction-

Deception is a problem which affects many relationships. While a single white lie can cause little or even no harm to a relationship, the feeling of “getting away” with little white lies can cause a problematic pattern. In fact, white lies often benefit the person lying and the person being lied to (Caoa, 2021). One main characteristic of pathological lying is that the lies told by a pathological liar are told for no real reason. Rather than a person lying to get out of trouble or at least telling a false statement to fulfill a personal goal, a pathological liar will lie with no clear intent. Pathological lying is a condition currently being researched as researchers are unaware as to if those suffering from this condition are aware they are lying or if they really believe their own lies. Because of this uncertainty, this research focuses on deception detection as detection of lies can be very useful in identifying false information. Deception in certain scenarios can be an especially large problem, such as on resumes, in interviews, or to a doctor as they have large, negative consequences making deception detection even more important. Lying increases the cognitive load necessary to carry out the task, as when compared to telling the truth, and negative overhanging consequences will likely increase a person’s motivation to come across as truthful. This increased motivation has been linked to more frequent displays of nonverbal deception cues (Walczyk, 2014).

There are many different types of questions that one can lie to. In my experiment, I used eight different types of questions: closed, open, probing, leading, loaded, funnel, recall & process, and rhetorical (Guthrie, 2018). Closed questions are often one-word answers where the person being asked the question is given two or more options to choose from. Open questions require more thought than open questions as elaboration on one’s answer is often encouraged. Probing questions often come in series and are used to avoid misunderstandings. This is done through each question in the series being more detailed than the last. Leading questions are asked

in a way in that the answering person has been steered towards a specific answer. Loaded questions are often viewed as manipulative as they are used to gain information which might not have been shared with them willingly prior to being asked. Funnel questions are like probing questions in that they start out broad and become more specific throughout a series of questions. Recall questions are questions which force the answering person to remember something in the past and process questions are when the answering person adds opinions or background information to the remembered memory/memories. Rhetorical questions are often used to keep listeners engaged and persuade the answering person to agree with the person asking the question.

Using this knowledge, I wanted to understand if the type of question a person was answering had an effect on the likelihood of a deception or truth being detected. I wanted to understand if the type of question had an effect on the verbal and nonverbal deception cues available to the participants viewing the tape. My hypothesis was that rhetorical questions would have the highest likelihood of causing both truth and deceptions to be detected. After rhetorical questions, I believed that recall and process questions would have the highest likelihood of causing a deception to be detected due to the increase in cognitive load of the liar.

Materials-

- camera
- laptop
- printer
- paper
- pen
- donuts

-cash prize

-calculator

Methods-

For this project, I filmed two participants, one female and one male. On film, these two participants, separate from one another, reacted to, and answered thirty-two questions. These thirty-two questions were split into eight groups of four questions each. These eight groups were open, closed, probing, leading, loading, funnel, recall and process, and rhetorical. The questions I asked were:

Closed:

1. Should vaccines be mandatory?
2. Are you a feminist?
3. Have you ever lied to a doctor?
4. Do video games contribute to youth violence?

Open:

1. Would you ever go vegetarian and why? (5)
2. What are your thoughts on hypnosis? (6)
3. At what age would you give your kid a phone and why? (7)
4. Should the death penalty be banned entirely and why? (8)

Probing:

1. What is your biggest fear? (9)
2. When did you realize that you were afraid of this? (10)
3. Why do you think you are afraid of this? (11)
4. Do you think you will ever overcome this fear? (12)

Leading:

1. Why should prisoners not be allowed to vote? (13)
2. Why should kids be taught cursive in school? (14)
3. Why is the SAT not an accurate representation of a student's intelligence? (15)
4. Why is dance not a sport? (16)

Loaded:

1. Have you stopped copying your friend's biology homework answers? (17)
2. Did you cry yesterday? (18)
3. Why did you not shower last night? (19)
4. Did you speed while driving again? (20)

Funnel:

1. Do you like New York? (21)
2. What is your favorite restaurant in the capital region? (22)
3. What is your favorite item on the menu? (23)
4. Would you ever work there? (24)

Recall and process:

1. Were you frightened by your dream last night? (25)
2. Did you enjoy eating the last thing you ate? (26)
3. Do you think your astrological sign corresponds with your personality? (27)
4. Did you make your bed this morning? Why? (28)

Rhetorical:

1. Can birds fly? (29)
2. Do you want to be a massive failure for the rest of your life? (30)

3. If your best friend jumped off a cliff, would you? (31)
4. Does this sound like a rhetorical question to you? (32)

To raise the motivation level of filmed participants, I awarded prizes (donuts or cash) to the participant with the least amount of correctly identified lies. Once participants were filmed, I then edited the two videos together, the product of which was then showed to twenty-five female adolescents. Each adolescent, upon being shown the video, was asked to answer a questionnaire with 128 questions on it. An example of two questions is below:

“Did participant one lie on question one?

Why or why not?”

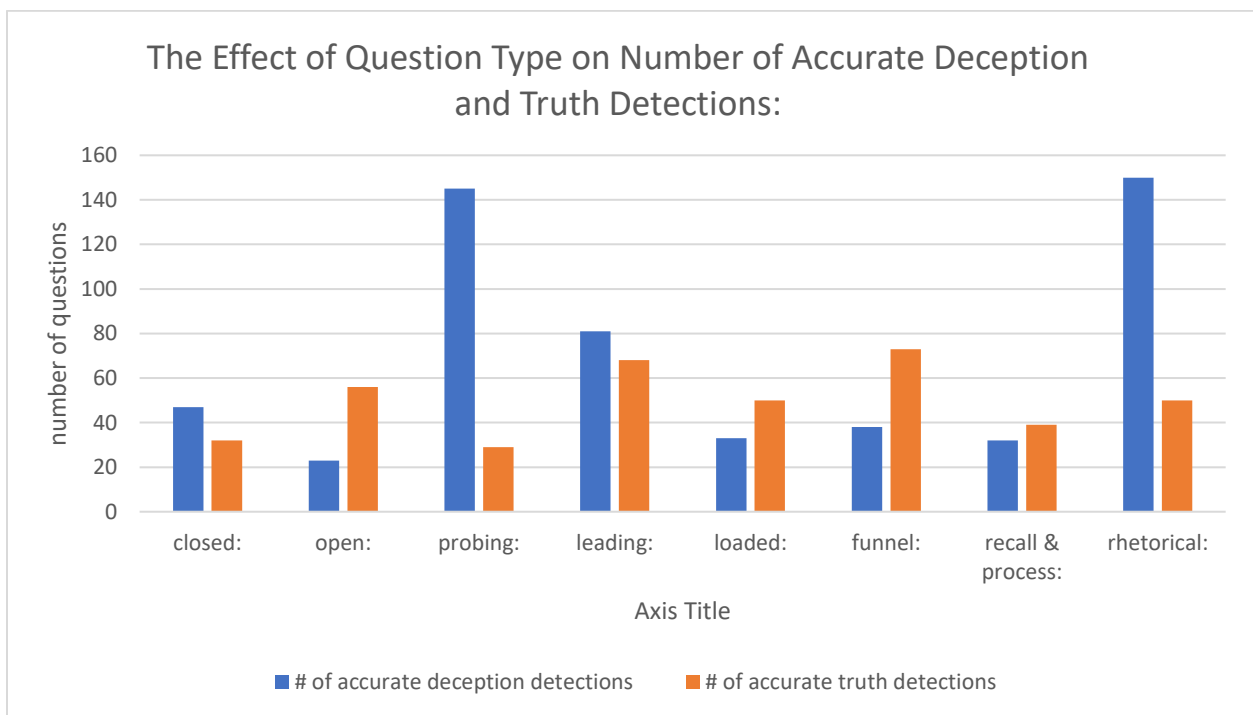
These responses were written by the twenty-five participants on paper. After collecting the twenty-five questionnaires, I began to digitalize them, typing up each question and hand-written response. I found key phrases throughout them. The key phrases were phrases which I found to be prevalent throughout the twenty-five flyers I received such as “he/she responded suspiciously quick” or “he/she broke eye contact when answering.” Then, using my key for which answers I instructed the filmed female and male participant to lie to/tell the truth to, I calculated how many accurate deception and truth detections there were. This data is compiled in “Data Table 1.” Using this data table, I created the table labelled “The effect of question type on number of accurate deception and truth detections.”

Tables/Graphs-

Data Table 1:

type of question	# of accurate deception detections	# of accurate truth detections
closed:	47	32
open:	23	56
probing:	145	29
leading:	81	68
loaded:	33	50
funnel:	38	73
recall & process:	32	39
rhetorical:	150	50

In Data Table 1, the number of accurate deception detections is portrayed in one column (the middle column) while in the rightmost column, the number of accurate truth detections is portrayed. Each row is out of 200 questions because of the twenty-five experimental participants answers to the four different questions (of each question type) asked of the filmed participants. For closed questions, less than half of the questions were accurately detected as either truths or deceptions. The same is true for open, loaded, and recall & process questions. Rhetorical questions had a 100% accurate detection of truths and deceptions as shown by the 150 accurate deception detections and 50 accurate truth detections adding to 200.



In this graph, Data Table 1 has been turned into a bar graph. It appears probing and rhetorical questions had a higher percentage of accurate deception detections than other types of questions, but due to the methodology I used, the filmed participants were instructed to lie to more probing and rhetorical questions (they were instructed to lie to three and tell the truth to one question) which results in there being more questions to accurately detect a

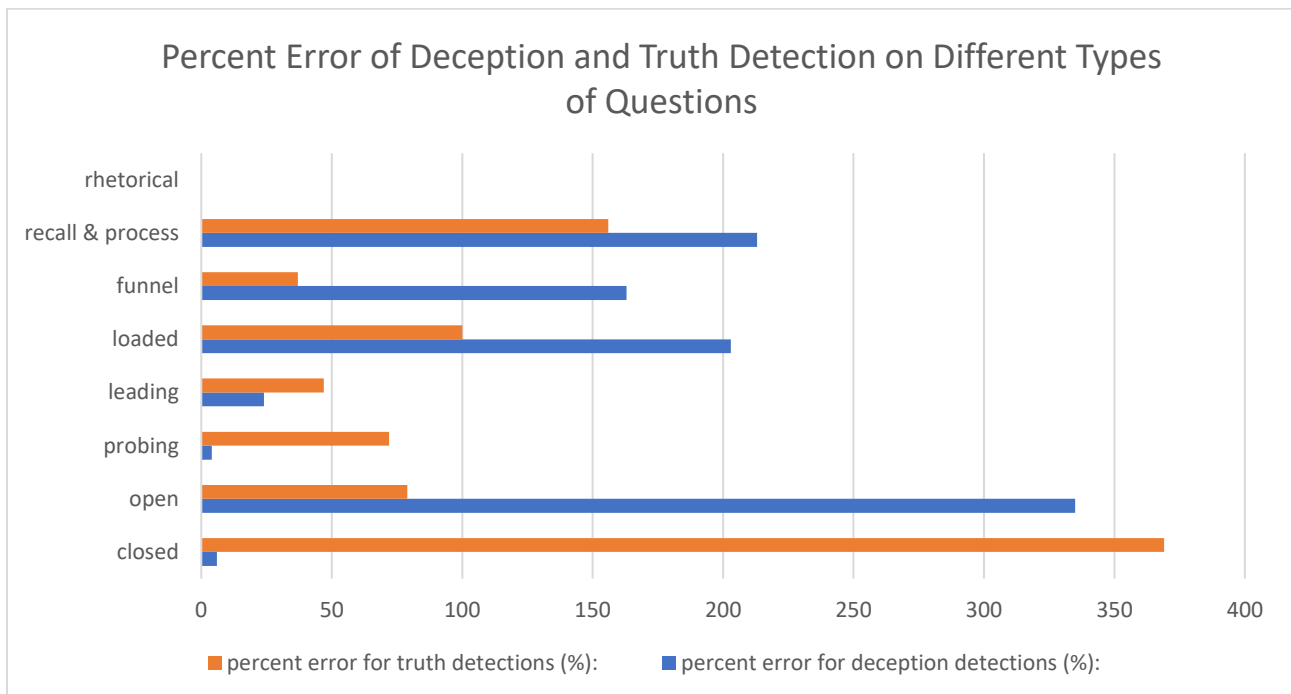
deception from. I decided to calculate the percentage of errors so that this would be represented in a data table and graph as compiled in “Data Table 2” and the graph below.

Data Table 2:

type of question:	percent error for deception detections (%):	percent error for truth detections (%):
closed	6	369
open	335	79
probing	4	72
leading	24	47
loaded	203	100
funnel	163	37
recall & process	213	156
rhetorical	0	0

Using the formula: $\text{percentage error} = (\text{estimated number} - \text{actual number}) / (\text{actual number}) \times 100$, I calculated percentage of errors. The estimated number was however many questions I instructed the filmed participants to lie to or tell the truth to over four (the number of questions for each question type), then I multiplied this by 200. I multiplied by 200 because there were 25 participants who each detected a truth or deception for eight questions due to watching two different videos. Thus, I calculated $25 \times 8 = 200$. Using the closed questions as an example, I instructed both the filmed participants to be truthful to three and lie to one. If all twenty-five participants detected the truths correctly, there would have been 150 correctly detected truths and 50 accurately detected deceptions.

Thus, $(150 - 32) / (32) \times 100 = 369\%$ error.



In this graph, Data Table 2 has been turned into a graph. Above, the percentage of error for deception and truth detections is being represented for each question type.

Discussion and Conclusion-

For closed questions, there were more accurate deception detections than truth detections while the opposite was true for open questions. Probing and leading both caused more accurate deception than truth detections while loaded, funnel, and recall & process questions also saw the opposite to be true. Rhetorical questions also caused more deception detections than truth detection.

Deception detections had an average of 119 percentage of error while truth detections had an average of 108 percentage of error. This means that truths had a higher likelihood of being detected than deceptions but due to the high percentage of error, I would label these results inconclusive. I hypothesize that the inconsistency between verbal and nonverbal cues in detecting deception versus truths is a cause for the high percentage of error. “The filmed participant took too long to answer” was a qualitative response given under an accurate deception detection while “He responded suspiciously quick” was another response which resulted in an accurate deception detection. A long response time, therefore, cannot be definitively labelled as a sign that deception will follow. In addition, “He took the time to think about the answer” was a response given which resulted in an accurate truth detection. These contradicting results from the nonverbal cue of response time might be the cause of the high percentage errors.

In further studies, I would increase the number of questions which I asked each person who was filmed. I would also have these people lie to and tell the truth to the same number of questions so that the results are exactly as they seem in a graph and viewers/readers of a research paper would not have to take into account percent error. In addition to this, I would ask

experimental participants more questions which have specific prompts about verbal versus nonverbal deception/truth detection.

A major source of error includes the small sample size and participants inability to accurately detect truth and deception through verbal and nonverbal deception cues. Humans need a trigger to clue them into detecting a deception (Levine, 2022). If key phrases, such as “he broke eye contact” or “she fidgeted while answering,” were absent, this, according to a 2022 study, could be the cause for inaccurate deception or truth detection and thus the reason for the relatively high percentage of error.

Acknowledgements-

I would like to thank Melanie for getting me through these past three years, I will miss our shared biweeklies. I would like to Melanie again for always providing positive energy during our class meetings.

References-

Caoa, Qian, et al. “White Lies in Tournaments.” *Journal of Behavioral and Experimental Economics*, North-Holland, 13 Nov. 2021, <https://www.sciencedirect.com/science/article/pii/S2214804321001312>.

Guthrie, Georgina. “The 8 Essential Questioning Techniques You Need to Know - Learn Wordpress.” *Nulab*, <https://nulab.com/learn/collaboration/the-8-essential-questioning-techniques-you-need-to-know/>.

Hartwig, Maria, et al. “Deception and Lie Detection in the Courtroom: The Effect of Defendants Wearing Medical Face Masks.” *Journal of Applied Research in Memory and Cognition*, No Longer Published by Elsevier, 24 Aug. 2021, <https://www.sciencedirect.com/science/article/pii/S2211368121000371>.

Markowitz, David M., et al. “The Deception Faucet: A Metaphor to Conceptualize Deception and Its Detection.” *New Ideas in Psychology*, Pergamon, 3 July 2020, <https://www.sciencedirect.com/science/article/pii/S0732118X19302703>.

“The 8 Essential Questioning Techniques You Need to Know - Learn Wordpress.” *Nulab*,
<https://nulab.com/learn/collaboration/the-8-essential-questioning-techniques-you-need-to-know/>.

Timothy R. Levine, et al. “Truth-Default Theory and the Psychology of Lying and Deception Detection.” *Current Opinion in Psychology*, Elsevier, 3 June 2022,
<https://www.sciencedirect.com/science/article/pii/S2352250X22000999>.

Walczyk, Jeffrey J., et al. “A Social-Cognitive Framework for Understanding Serious Lies: Activation-Decision-Construction-Action Theory.” *New Ideas in Psychology*, Pergamon, 13 Apr. 2014, <https://www.sciencedirect.com/science/article/pii/S0732118X14000142>.