

Gender Differences and Confidence Levels in Lie Detection, Based on Facial Expressions and Upper Body Language

Jorine Heijboer, Manon Kitselaar, Willeke van Orsouw, Maaïke van Rosmalen, Martine Sedy, & Samantha Verhoeven

Abstract

This study investigated if people are able to detect lies based on facial expressions and upper body language in short, only visual, video clips. These video clips consisted of people telling lies or truthful statements and were judged by 80 participants. The participants reported if people were lying or telling the truth, and how confident they were about their judgement. The results showed no main effect of accuracy in detecting lies or truth. However, there was an effect of gender in videoclips. When men were lying in the clips, participants achieved a higher accuracy score than for women who were lying, and when women were truthful, a higher accuracy score was obtained than when men were lying. In addition, women did not perform better than men, in fact the opposite was true. Furthermore, men were more confident about their judgments than women. Implications and recommendations for future research are discussed.

Keywords: lie detection; deception judgments; nonverbal; facial expressions; accuracy; gender differences; gender confidence.

Introduction

A study by Feldman, Forrest, and Happ (2002) has shown that in a ten minute conversation with a stranger, people tell an average of three lies. Although children are often taught that lying is considered bad behavior, many have grasped the concept at a very young age (Talwar & Lee, 2008) and becomes a normal thing to do in everyday life. This study focuses on people's ability to detect lies in a specific context. While many previous studies, dealing with deception detection, conducted experiments in a 'laboratory setting' with people receiving explicit instructions to lie or tell the truth, the current study attempts to examine a communicative setting that is more spontaneous and natural and has the following research question: *Are people able to detect lies based on facial expressions and upper body language in short, only visual, video clips?*

Although the concept of lying knows no universally accepted definition (Kagan, as cited in Mahon, 2007), it is considered to be a form of deception which is defined as the intention to cause another person to have a false belief (Barnes, 2007). Mahon (2007) examined several definitions and his definition of lying to another person will be used as the starting point for the current study: "to make a believed-false statement (to another person), either with the intention that that statement be believed to be true (by the other person), or with the intention that it be believed (by the other person) that that statement is believed to be true (by the person making the statement), or with both intentions" (p. 211). Furthermore, various types of lies exist with many

gradations of consequences and severity. These may vary, for example, from harmless exaggeration to intentional and habitual deceit. Central in this study are lies that are often considered to be harmless such as grey and honest lies.

When detecting lies, previous studies have shown that body language cues as well as facial cues provide valuable information (Ekman & Friesen, 1974; Ten Brinke, Porter, & Baker, 2012). This type of non-verbal communication is also known as 'leakage' (Warren, Schertler, & Bull, 2009) and tends to increase when people are lying (Sporer & Schwandt, 2007). Although many techniques are considered to be useful to detect lies, the majority of people are not very successful at doing this (Ekman & O'Sullivan, 1991). A meta-analysis by Bond and DePaulo (2006) showed that the general accuracy of people as lie detectors is only slightly better than chance. A similar accuracy was reported in another meta-analysis by Aamodt and Custer (2006) for both untrained and trained people, where trained people were those who often dealt with lie detection due to their profession, such as detectives, psychologists, and judges. Therefore, the first hypothesis suggests that people will distinguish lies from truth poorly, even when important cues as facial expressions and upper body language are visible.

Even though it is generally difficult for people to detect lies, there may be interesting differences between men and women. Gender differences and lying behavior have been studied before, for example regarding lying frequency, however, often with contradictory findings. While many studies showed that men are more frequent liars than women (Dreber & Johannesson, 2008; Jensen et al., 2004; Stouthamer-Loeber, 1986), others provided no support for frequency differences (Tosone, 2006; Konecny, 2009). Although studies regarding men's and women's lie detection abilities are limited, the same contradictory findings can be found here as well. While one study showed that women are better lie detectors (McCornack & Levine, 1990), the opposite was true for another (DePaulo, Epstein, & Wyer, 1993). A possible explanation for these inconsistent results might be due to different experimental variables that interacted with the result, such as some features of the participants. While the first study included romantic couples who dated for an average of 14 months, the other involved students who did not know each other. This might indicate that women become better at detecting lies when they are interacting with someone they know (well). However, other theories may also provide support why women could, generally speaking, be better lie detectors than men. First, studies have shown that women excel in decoding nonverbal cues, which plays an essential

role in lie detection (Hall, 1978; Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979). Second, the decoding ability may be related to theories about women's greater sense of empathy. A longitudinal study by Mestre, Samper, Frias, and Tur (2009) confirmed a greater empathic response in females with strong and medium effect sizes for both emotional and cognitive empathy. As emotions of fear and guilt tend to emerge while lying (Ekman, 1985), this could mean that it might be less difficult for women to detect lies, than it is for men. Therefore, the second hypothesis suggests that women will be better at detecting lies than men, even when judging videos that include strangers. Furthermore, as gender differences play a central role in the current study it will also be examined whether differences can be found among men and women and their accuracy for detecting lies.

Another difference between men and women that will receive attention in this study regards the confidence level and accuracy rate for detecting lies. Previous research suggests that, generally, men have a higher confidence level than women, and also tend to be more confident about a test performance, without resulting into better achievements (Hyde et al., 1990; Fennema & Sherman, 1978; Zuckerman, 1987). The same results were visible for a study that included a test for lie detection (DePaulo, Charlton, Cooper, Lindsay, & Muhlenbruck, 1997), where it was confirmed that men were more confident about their judgment of a person lying or telling the truth, but not with a higher accuracy. Therefore, the third hypothesis suggests that men will be more confident about their judgments than women, but not with a higher accuracy score.

Method

Design

The research question of the current study attempted to answer if people are able to detect lies, based on facial expressions and upper body language in short, only visual, video clips. A 2x2x2 design was conducted to answer the research question. The independent variables were context (lies and truths), gender in video (men and women) and gender of the judge (men and women). The dependent variables were the accuracy of lie detection and the degree of confidence. This study conducted a combined subject design, as the independent variables context and gender in video were a within-subject design, and the gender of the judges was a between-subject design.

Stimuli Collection

Selection Criteria and Procedure All videos were collected from the online database on YouTube. To select appropriate videos for the analysis, several selection criteria were set up. First, all videos were selected from the Jimmy Kimmel show, where random pedestrians were asked a question by a reporter. Second, for the first condition (people lying in a video clip), videos were selected from 'Lie Witness News', where interviewees responded to a

question about something that never happened or was (obviously) incorrect, such as "What do you think about the speech this morning of Dr. Martin Luther King Junior?" (Jimmy Kimmel Live, 2015). Only videos were used where interviewees responded to the question, seemingly trying to provide an honest answer as if the statement were true.

For the second condition (people telling the truth), videos were also used from the Jimmy Kimmel show, namely fragments of the 'Pedestrian Questions' series, which had the same visual format as 'Lie Witness News', ensuring that participants would not see explicit differences between the two conditions. In the second condition, interviewees responded to a simple question such as "Do you have a black friend?". It was assumed that interviewees were telling the truth as these kind of questions were simple and more or less verifiable, for instance in this example, the interviewer called the interviewee's friend to verify the answer. Third, only videos were selected where the interviewee's face was clearly visible. In total, for both conditions (lying versus truth telling) twenty videos were selected. In each condition it was taken into account that ten males and ten females were presented, so it could be measured if women or men were better at telling a lie. After the selection, the videos were edited into short clips.

Video editing All selected YouTube videos were cropped into short clips with the video-editing program Windows Live Movie Maker. For each clip, it was ensured that only the interviewee was clearly visible, without wearing accessories e.g. sunglasses or other items that might affect the perception of their non verbal behavior. Additionally, the clips showed the interviewees answering a question. All clips were cropped to an approximate duration of five seconds. The audio was removed, which ensured participants could only focus on non-verbal behavior in the perception test.



Figure 1: Interview truth: Have You Ever Smoked Pot? Adapted from YouTube website, by Jimmy Kimmel Live, 2012 retrieved from: <https://www.youtube.com/watch?v=4JhVvlQaG8c>.



Figure 2: Interview Lie: Lie Witness News – President Obama’s Birthday Edition. Adapted from YouTube website, by Jimmy Kimmel Live, 2014 retrieved from: <https://www.youtube.com/watch?v=iKtjgxQ1utw>.

Perception Test

Participants In total, 80 participants completed the online perception test of which 37 (46.3%) were female and 43 (53.7%) were male. Their age ranged from 17 to 68 ($M = 28.1$, $SD = 10.6$). Additionally, all participants had a Dutch nationality.

Materials and Procedure Participants judged all forty video clips in an online questionnaire which was designed with Qualtrics. All the cropped video clips were placed online in a secure environment on YouTube. The clips were imported into Qualtrics and displayed in a random sequence. Participants needed to determine whether the person in each clip was either lying or telling the truth. Additionally, for each clip the participants rated how certain they were about their answer on a 7-point scale (1 = totally unsure, 7 = totally sure). No time limit was included to judge the video clips; they could watch it as often as they would like and they could decide when to move on to the next video clip.

The online questionnaire started with a short introduction and instruction text, which mentioned that the participant would watch short clips without audio, and the two questions that had to be answered for each clip were explained. Furthermore, it was stated they were allowed to watch the clip as many times as they wanted, but in case of doubts, it was recommended to fill in the first answer that came to mind. Finally, it was mentioned that the questionnaire would last for approximately ten to fifteen minutes, that participation was completely anonymous and their answers would only be used for the current study. When they finished the perception test, the respondents filled in a short additional questionnaire, which included questions regarding their age, gender, and if they were familiar with any of the clips.

Results

All data from the online questionnaire were analyzed with SPSS. New variables were coded in order to conduct several analyses with a repeated measures ANOVA for testing the hypotheses. To test the hypothesis regarding lie detection abilities for men and women who judged the video clips, a between-subject design was used, whereas for testing gender in video clips a within-subject design was used. The first repeated measures ANOVA was conducted,

where the independent variable was context (lying versus truth telling) and the dependent variable was subjects’ accuracy in lie detection. The analysis revealed a nonsignificant main effect of context on the accuracy of participants in judging the videos (with a perfect accuracy score being 10 and imperfect score being 0), indicating that participants are bad at distinguishing lies ($M = 4.83$, $SD = 0.16$) from truth ($M = 4.54$, $SD = 0.17$), $F(1, 78) = 1.61$, $p = .21$, $\eta^2 = .020$.

However, although no significant main effect was found for the accuracy in detecting either lies or truths, a significant interaction effect was found for the context and the gender in the video clips on the accuracy in lie detection ($F(1,78) = 32.90$, $p < .001$, $\eta^2 = .30$). This result indicated that participants had a higher accuracy in clips with a lying male ($M = 5.02$, $SD = 0.68$) than truth telling males ($M = 5.00$, $SD = 0.73$), and a higher accuracy when women were telling the truth ($M = 5.01$, $SD = 0.74$) than when they were lying ($M = 4.98$, $SD = 0.74$).

Second, a repeated measures ANOVA was conducted where gender was included as independent variable, and participants’ accuracy as the dependent variable. This analysis almost showed a significant main effect of participants’ gender on accuracy, $F(1,78) = 3.93$, $p = .051$, $\eta^2 = .048$, indicating that men were better at detecting lies ($M = 4.91$, $SD = 0.16$) than women ($M = 4.45$, $SD = 0.17$).

Finally, a repeated measures ANOVA was conducted with gender as the independent variable and confidence as the dependent variable. A significant main effect of gender on the degree of confidence in detecting lies was found, $F(1, 78) = 8.38$, $p = .005$, $\eta^2 = .097$, which indicated that men were more confident about their judgments ($M = 5.18$, $SD = 0.86$) than women ($M = 4.81$, $SD = 0.93$).

Discussion

Based on the results of the current study, several explanations can be drawn which deserve attention. The first hypothesis stated that people would distinguish lies from truth poorly, even when important cues as facial expressions and upper body language are visible. A benefit of the current study is that spontaneous clips were analyzed that were recorded on the street, and not in a laboratory. However, seeing that people were interviewed and answered in front of the camera, this may have caused some of them to feel more nervous, which could have impacted people’s judgment. Nevertheless, as expected, the results for the first hypothesis showed that people did not perform well at distinguishing lies from truths. These results are in line with previous research of Bond and DePaulo (2006) and Aamodt and Custer (2006) who concluded people have a low accuracy for lie detection.

Additionally, something else that may have affected the results may be due to an element in the questionnaire that people used to judge a video clip. As participants were asked if the person in the video was lying, there is a chance that participant were slightly biased due to a wording effect.

Future research could also change the question to whether people were telling the truth, or “Is this person lying or telling the truth?”, to exclude a wording effect on people’s response behavior in questionnaires.

Interestingly, the results did show that subjects had a higher accuracy for men who were lying, than women who were telling the truth. A possible explanation could be that women are, generally, more perceived as trustful than men and, therefore, more often judged as reliable. This has also been found in the individual analysis of the video clips, which will be discussed in the next section of the discussion. Another possibility deals with studies that showed men are more frequent liars (Dreber & Johannesson, 2008; Jensen et al., 2004), which could have led to a generalization that men lie more often. Therefore, in case of doubt, respondents may have marked a male more often as a liar, and the opposite for women. For future research it could be interesting to investigate gender in different conditions, e.g. where one condition contains only men in the video clips, judged by both women and men, and in the second condition only women in the video clips, judged by both women and men. In addition, it could be interesting to investigate different types of lies, such as (un)emotional lies which could have an effect of the amount of leakage a person produces (Sporer & Schwandt, 2007).

The second hypothesis suggested that women will be better at detecting lies than men, even when judging videos that include strangers. The results, however, showed otherwise, as men were (almost significantly) better at detecting lies than women, which is also partly in line with the findings of DePaulo et al. (1993) who concluded that men were better lie detectors when judging strangers. This remains an interesting finding as a meta-analysis by Bond and DePaulo (2006) did not find a difference in the success rate between men and women. Perhaps, even though women are good at encoding non verbal cues and are more empathic, they indeed become weak at detecting lies told by strangers, compared to lies told by intimates (McCornack & Levine, 1990). Possibly, women’s higher empathic abilities could have negatively impacted their accuracy, as they may have sympathized with the liar. Since the results in this study almost showed a significant result for the lie detection abilities between men and women, future research could examine this gender difference on lie detection accuracy, for example by increasing the sample size and letting men and women judge lies and truths told by strangers and familiar people, such as friends.

The third hypothesis predicted that men would be more confident about their judgment than women, but not with a higher accuracy. This hypothesis can be partly confirmed, as men indeed were more confident about their judgments than women, but also their accuracy in lie detection was (almost significantly) higher. This result corresponds with previous studies, as men tend to have a higher confidence level than women about test results (Hyde et al., 1990; Fennema & Sherman, 1978; Zuckerman, 1987). It was not expected, however, that the higher confidence levels would possibly

correlate with higher test scores (DePaulo et al., 1997), which was the case in the current study to a certain degree, seeing that men almost scored significantly better than women. Though, the results indicated that the accuracy rate for male and female judges remains around chance. Nevertheless, it can be questioned whether it is indeed always true that confidence levels does not have an effect on the achieved score.

Individual analysis of the video clips Video clips were analyzed separately to examine if interesting cues were present for liars and truth tellers. A total of seven clips were used, for which at least 75 percent labeled someone as a truth teller or liar, regardless of the answer being right or wrong. Three clips included young lying girls, but participants thought they were telling the truth. These girls were all quite young (<30 years old) and gazed at the interviewer. Furthermore, a young girl who was telling the truth and laughed often, was also seen as truthful. This may suggest that participants see young girls as more honest. In another video, a man was telling the truth and was also rated as truth teller. He stared at the interviewer almost the entire time, showing little facial expression, but made obvious hand gestures. Another remarkable result was found for two people who were lying and were also detected as liars (Figure 3 and 4). The woman and the man often averted their gaze from the camera and interviewer, which is believed to be a cue for deception by many. However, as a meta-analysis by DePaulo et al. (2006) showed that this belief is false, perhaps it does seem to apply to people who are in a situation that may cause high nervousness, which could make people forget to pay attention to non verbal communication, in order to cover their lie successfully. For example in a situation when being in front of the camera, and perhaps knowing that one will be on television.



Figure 3: Lying woman Figure 4: Lying man

Conclusion

The aim of the current study was to examine to what extent people are able to detect lies based on facial expressions and upper body language in short, only visual, video clips. Based on the results, it can be concluded that, compared to women, men are more confident about their judgment and also slightly better at detecting lies. However, for both sexes, judgments did not significantly differ from chance. Furthermore, when it comes to detecting lies or truths told by men and women, it seems that judges’ performance is more successful when detecting lies told by men than when they are told by women.

References

- Aamodt, M. G., & Custer, H. (2006). Who can best catch a liar? A meta-analysis of individual differences in detecting deception. *Forensic Examiner, 15*(1), 6-11.
- Barnes, A. (2007). *Seeing through self-deception*. Cambridge University Press.
- Bond, C. F., & DePaulo, B. M. (2006). Accuracy of deception judgments. *Personality and Social Psychology Review, 10*(3), 214-234.
- DePaulo, B. M., Charlton, K., Cooper, H., Lindsay, J. J., & Muhlenbruck, L. (1997). The accuracy-confidence correlation in the detection of deception. *Personality and Social Psychology Review, 1*(4), 346-357.
- DePaulo, B. M., Epstein, J. A., & Wyer, M. M. (1993). *Sex differences in lying: How women and men deal with the dilemma of deceit*.
- Dreber, A., Johannesson, M., 2008. Gender differences in deception. *Economics Letters, 99*, 197-199.
- Ekman, P. (1985). *Telling lies: Clues to deceit in the marketplace, marriage, and politics*. New York: Norton
- Ekman, P., & Friesen, W. V. (1974). Detecting deception from the body or face. *Journal of Personality and Social Psychology, 29*(3), 288.
- Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American psychologist, 46*(9), 913.
- Feldman, R. S., Forrest, J. A., & Happ, B. R. (2002). Self-presentation and verbal deception: Do self-presenters lie more? *Basic and Applied Social Psychology, 24*(2), 163-170.
- Fennema, E. H., & Sherman, J. A. (1978). Sex-related differences in mathematics achievement and related factors: A further study. *Journal for Research in Mathematics Education, 9*, 189- 203.
- Hall, J. A. (1978). Gender effects in decoding nonverbal cues. *Psychological bulletin, 85*(4), 845.
- Hyde, J. S., Fennema, E., Ryan, M., Frost, L. A., & Hopp, C. (1990). Gender comparisons of mathematics attitudes and affect: A meta-analysis. *Psychology of Women Quarterly, 14*, 299- 324.
- Jensen, L. A., Arnett, J. J., Feldman, S. S., & Cauffman, E. (2004). The right to do wrong: Lying to parents among adolescents and emerging adults. *Journal of Youth and Adolescence, 33*(2), 101-112.
- Jimmy Kimmel Live. (2012) Have You Ever Smoked Pot? [Youtube film]. Retrieved from: <https://www.youtube.com/watch?v=4JhVvlQaG8c>.
- Jimmy Kimmel Live. (2013) Lie Witness News – Kim and Kanye's New Baby [YouTube film]. Retrieved from: <https://www.youtube.com/watch?v=cFAnazn7sqM>.
- Jimmy Kimmel Live. (2014) Lie Witness News – Preparing for the big one [YouTube film]. Retrieved from: https://www.youtube.com/watch?v=cM2Rt_XdJBM.
- Jimmy Kimmel Live. (2014) Lie Witness News – President Obama's Birthday Edition [YouTube film]. Retrieved from: <https://www.youtube.com/watch?v=iKtjgxQ1utw>.
- Jimmy Kimmel Live. (2015) Lie Witness News - Do You have a black Friend? [YouTube film]. Retrieved from: <https://www.youtube.com/watch?v=yrR48pQTQhc>.
- Jimmy Kimmel Live. (2015) Lie Witness News - Dr. Martin Luther King Jr. Edition. [YouTube film]. Retrieved from: <https://www.youtube.com/watch?v=E4LnwRE5oeg>
- Konecny, S. (2009). Virtual Environment and Lying: Perspective of Czech Adolescents and Young Adults. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 3* (2), article (search in Issues).
- Mahon, J. E. (2007). A definition of deceiving. *International Journal of Applied Philosophy, 21*(2), 181-194.
- McCornack, S. A., & Levine, T. R. (1990). When lovers become leery: The relationship between suspicion and accuracy in detecting deception. *Communications Monographs, 57*(3), 219-230.
- Mestre, M. V., Samper, P., Frías, M. D., & Tur, A. M. (2009). Are women more empathetic than men? A longitudinal study in adolescence. *The Spanish Journal of Psychology, 12*(01), 76-83.
- Rosenthal, R., Hall, J. A., DiMatteo, M. R., Rogers, P. L., & Archer, D. (1979). *Sensitivity to nonverbal communication: The PONS test*. Baltimore: Johns Hopkins University Press.
- Sporer, S. L., & Schwandt, B. (2007). Moderators of nonverbal indicators of deception: A meta-analytic synthesis. *Psychology, Public Policy, and Law, 13*(1), 1.
- Stouthamer-Loeber, M. (1986). Lying as a problem behavior in children: A review. *Clinical Psychology Review, 6*(4), 267-289.
- Talwar, V., & Lee, K. (2008). Social and cognitive correlates of children's lying behavior. *Child Development, 79*(4), 866-881.
- Ten Brinke, L., Porter, S., & Baker, A. (2012). Darwin the detective: Observable facial muscle contractions reveal emotional high-stakes lies. *Evolution and Human Behavior, 33*(4), 411-416.
- Tosone, C. (2006). Living everyday lies; the experience of self. *Clinical Social Work Journal, 34*(3), 335-348.
- Warren, G., Schertler, E., & Bull, P. (2009). Detecting deception from emotional and unemotional cues. *Journal of Nonverbal Behavior, 33*(1), 59-69.
- Zuckerman, H. (1987). Persistence and change in the careers of men and women scientists and engineers: A review of current research. In L. S. Dix (Ed.), *Women: Their underrepresentation and career differentials in science and engineering* (pp. 123- 156). Proceedings of a workshop at the National Academy of Sciences. Washington, DC: National Academy Press.