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LIE DETECTION AND BLINDNESS: RESEARCH IN PANDEMIC TIMES

INTRODUCTION

People lie for different reasons and with different aims, but the fact is that they lie frequently. Lying is part of human everyday interactions, therefore the ability to detect lies during communication is not only practical, but also necessary. These words get new meaning in the current coronavirus crisis when social media bombard us with a large number of messages, not all of which are precise, confirmed, reliable or true. Also at the present time, studies have indicated the growth of numerous pseudoscientific lies and fake news related to COVID-19 along with the increase of social panic, irrational behaviour, and pseudoscientific beliefs resulting from them (Escolà-Gascón 2). Detection of lies and various forms of deception, including mystification, bluffing, excuses, bullshitting and others, have received considerable attention of scholars in psychology, sociology, linguistics, neuroscience and many other disciplines. Previous research concentrated on exploring differences in the behaviour of liars and truth-tellers, strategies of lie detection, and improvement of detection accuracy. In general, studies reveal that normal people are usually no better than chance at detecting lies (Bond and DePaulo 214). This means that nearly half of the deceptive messages received on a daily basis remain undetected and are wrongly interpreted as true. If catching lies is so difficult for people without any impairments or deficits, the question arises whether

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blind individuals who receive perceptually impoverished information during communication, are able to tell lies from truths.

So far the impact of visual deprivation on lie-catching abilities has been completely neglected in literature and there are practically no scientific investigations in this area. As a result, it is completely unknown whether blind and sighted individuals differ in making veracity judgements and whether the lack of vision may impair people's abilities to interpret intentional deceit, making them more prone to manipulation. The aim of this article is to explore the impact of visual impairment on lie-detection accuracy during natural communication and to compare the lie-catching abilities of blind and sighted individuals.

Lying can be defined as a deliberate act of leading a person into a false belief (Meibauer 358). In other words, a lier intends his or her interlocutor to believe in what they know to be false. Lie detection consists in recognizing the speaker's intentions to make the hearer believe the dishonest utterance. This means that both lying and lie detection are exercises in Theory of Mind (ToM), pertaining to the ability to attribute mental states to oneself and others (Premack and Woodruff 515). The relationship between ToM and lying has been well documented in literature. Studies show that children younger than four, who have not yet developed ToM and who are not fully aware of other people's thoughts, feelings and beliefs, do not seem to be capable of lying (Ding et al. 1812). Children at this age are also unable to correctly discriminate between lies and truths (Vendetti et al. 823), and between deceitful utterances and jokes or irony (Leekam 159, Zufferey 111).

Similarly, individuals with autistic spectrum disorder, who persistently fail in ToM tests, have been found to have difficulties with deception detection (Baron-Cohen 1141; Dennis et al. 370; Li et al. 185; Oswald and Ollendick 119; Russell et al. 331; Sodian and Frith 591; Yang et al. 615; van Tiel et al. 255). This further confirms that ToM abilities and lying detection are related. In the blind population previous research has showed that visually impaired children are also significantly delayed in acquiring ToM (Minter et al. 138, Korkmaz 104) and, compared to sighted children, they perform less successfully in ToM tasks (Brambring and Asbrock 1471, Green et al. 1, McAlpine and Moore 349). It has been speculated that this is because vision plays a significant role in ToM, providing important information about mental states of others. These speculations have not been confirmed in blind adults who demonstrate a complete understanding of the experiences of others and do not have deficits in mindreading (Koster-Hale et al. 65, Bedny et al. 11314). In spite of this, individuals who are blind, due to their visual limitations, have been

observed to understand other people's intentions, emotions and beliefs differently than sighted people (Sak-Wernicka 866). What is more, the study by Ferrari, Vecchi, Marabet and Cattaneo (160), investigating the impact of visual impairment on the judgements of others' trustworthiness, indicated that blind subjects were more positively biased than sighted controls in the evaluation of socially acceptable behaviour, but they did not differ from the sighted group in rating negative behaviours. This, according to the researchers, suggests that "visual deprivation may have a dramatic effect on the evaluation of social factors" and that "blind individuals may rely on different strategies when forming impressions about agents' trustworthiness" (156). Due to the lack of appropriate studies, it is yet unknown what impact the above-mentioned difficulties and differences observed in the blind population have on their lie-catching abilities. It might be, however, expected that people who are blind may understand speakers' intentions differently and therefore they may rate honest or dishonest utterances differently than people who are sighted.

Lying requires much more cognitive effort than telling the truth (Vrij et al. 39, Walczyk et al. 755). A person who is lying must create a story based on non-existent and imagined experiences or attitudes which will seem plausible to a hearer. What is more, liars must constantly control the content of their stories, so as to seem sincere and avoid being exposed. The cognitive load involved in the processing may give rise to specific behaviour and impact how liars are speaking and what they are saying. It is difficult to ascertain on what basis people make subjective judgements about whether a person is lying or not. The most popular approach is that one can recognise a liar on the basis of the individual's non-verbal behaviour. Unable to completely control their behaviour and supress the emotions of fear, guilt or delight co-occurring with lying, people who lie give themselves away through specific "leakage cues" which they unconsciously produce (Ekman and Friesen 88). Gaze aversion, looking up to the right, head shaking, touching lips while speaking, prolonged and deliberate eye contact, blinking, or fidgeting are among visual cues which most often are associated with deception (see the analysis by DePaolo et al. 91-95, Mann et al. 205, Mann et al. 452, Vrij et al. 309). Visual cues are believed to play a critical role in lie detection as they provide semantically distinctive and automatically alerting information. People who are blind do not have access to these non-verbal cues during communication, and, in consequence, may be expected to have difficulties in detecting deceit in other people's utterances.

On the other hand, experimental investigations provide little support for the claims that specific visual cues are indicative of deception, showing that the

cues are too ambiguous and unreliable to become diagnostic (see, e.g., Vrij et al. 307, Porter and ten Brinke 508, Wiseman et al. 5). What is more, studies show that people who lie are less likely to produce the cues which their listeners associate with lying, so as to avoid being unmasked (Loy et al. 15). This basically means that the behaviours normally associated with lying do not have to occur in everyone who is lying, and even if the cues are not observed, it does not have to mean that the person is telling the truth. As a result of this it is very easy to misinterpret the visual cues and to be tricked by them. Additionally, different individuals may perform different cues when they lie. The distribution of these cues may vary depending on a situation. For example, it is argued that people are more likely to give away certain nonverbal cues when they tell high-stake rather than low-stake lies (O'Sullivan et al. 530, Wright et al. 1-2). Another thing is that cues to deceit may be a combination of different individual behaviours, which makes it difficult, even for a sighted person, to recognise.

Taking into consideration all these limitations, it seems well-justified to ask whether people who have no access to these cues can really be at disadvantage in lie detection. It is also worth considering whether concentrating on other cues will not provide the individuals with more accurate information concerning speakers' actual intentions. As explained by Burgoon et al. (80-81), sighted people "display a strong visual bias", as a result of which visual cues distract the people's attention from more consistent and reliable information, such as auditory or verbal cues. These are the cues blind people rely on when interpreting utterances.

Auditory cues are considered more reliable in lie detection, as they are "a better source of deception and leakage" than, for example, facial expressions (Zuckerman et al. 347). Tone and pitch of voice, speech rates, latency periods, and speech fillers are regarded as the secondary source of information to people who are sighted. If visual information is available, they find it easier and more convenient to make judgements on its basis. However, the study by Bond and DePaulo (214) showed that people asked to make veracity judgements were more accurate when they could only hear a person lying or telling the truth, but could not see this person. What is more, the researchers observed that people who had only access to visual cues tended to be more lie biased. Although vocal cues such as repetitions, sentence change, slips of the tongue, incompletions, filled pauses or hesitations are frequently associated with deception, as in the case of visual cues, they have not been sufficiently confirmed to be diagnostic (Vrij et al. 309).

However, recent analyses have indicated that one can learn a lot about people's underlying intentions, thoughts, and emotions by looking closely on

the language people use (Newman et al. 666). The analyses suggest that it is possible to detect lies or deception from verbal cues people use when lying. As Meibauer (357) explains, "the potential for lying is rooted in the language system", and therefore the language should provide some insight into a liar's state of mind. Consistently with these predictions, linguistic analyses reveal that, compared to true stories, lies are qualitatively different (Newman et al. 666). For example, people who lie can be observed to use fewer markers of cognitive complexity, fewer self-references and more negative emotion words. These different patterns of language may reflect the liars' cognitive overload, dissociation from their own statements and negative feelings they experience while lying. What is more, compared to people who are telling the truth, liars can be observed to provide less information, and the logical structure of their statements may seem incoherent or unconcise. Although this approach is relatively new and it requires extensive work, the available studies suggest that people may detect lies more accurately if they rely on verbal information (Vrij et al. 307). If this is true, there are significant reasons to assume that blind people who do not have access to visual information and concentrate on verbal information available to them during communication, may be better able to detect lies than sighted people who often base their judgements on behavioural cues. What is more, people with visual impairment have been found to demonstrate faster and superior auditory and speech perception (Niemeyer and Starlinger 510, Röder et al. 162). This may allow them to perceive certain (seemingly unimportant) nuances in a person's speech and detect lies more accurately than people with normal vision.

The aim of the current study is to investigate the impact of blindness on lie-catching abilities of individuals. The main objective is to explore whether people who are blind and who have no access to visual cues are less successful in discriminating between truthful and deceitful utterances than people with unlimited access to visual information. The study is also intended to show whether visual impairment and the type of utterance may have an effect on the confidence of individuals in making veracity judgments. Due to the current pandemic situation, the study was conducted in accordance with the sanitary regime using appropriate methods and tools. It was our priority to guarantee comfort and safety of the participants, keeping in mind that many blind individuals have specific comorbidities diagnosed and may be at higher risk of severe COVID-19. It is important to note that because of the pandemic many people (both blind and sighted) were unwilling to meet or travel for fear of contracting the disease. This meant that performing a lab experiment

on a representative sample of blind and sighted people was not possible and therefore the experiment had to be conducted remotely via the Internet.

METHOD

Participants

A total group of 66 adults between 20 and 50 years of age were recruited online and participated in the study. There were 19 congenitally blind or early-blind adults with no functional vision (11 women and 8 men). Individuals with ocular-plus blindness or who were partially sighted did not take part in the study. The visually impaired participants were students or graduates of the John Paul II Catholic University of Lublin (Poland), or they were recruited via the Internet from Polish online discussion groups for the blind. 47 participants with normal vision (30 women and 17 men) also participated in the study. They were students, administrative workers or academic teachers at the University. Participant characteristics are shown in table 1. All participants were Polish native speakers. The participation in the study was voluntary and all participants gave informed consent.

Table 1. Participant characteristics.

	Blind (n = 19)	Sighted (n = 47)
Gender		
Male	8	17
Female	11	30
Age range (yrs)		
20–30	10	22
31–40	9	15
41–50	0	10
Mean (SD)	30.42 (5.42)	33.51 (9.06)
Education		
Secondary	4	2
Higher (BA degree)	4	14
Higher (MA degree)	11	31
Occupation		
Student	8	13
Employed	9	34
Unemployed	2	0

Material

The material for the study was prepared well before the outbreak of the pandemic. Ten students of the John Paul II Catholic University of Lublin (5 men and 5 women) volunteered to participate in short interviews. The respondents were given a list of seven personal questions and asked to choose one question they would like to respond to. Five interviewees were asked to tell the truth and five other students were asked to lie. Among other things, the questions concerned the individuals' job satisfaction, attitudes towards environmental protection, most awkward situation in their lives and experience with online dating applications. Each interviewee was given one minute to prepare before they provided the answer. All answers were recorded using a digital HD camera. The position of the camera was such that the entire body of the speaker was captured. Each recording lasted approximately 1 minute. Next, the soundtrack for the film was separately recorded using the Audacity computer program. The audio filters were used in order to amplify the audio signal and remove disrupting noises.

Procedure

The study was designed to investigate the impact of visual impairment on lie detection. All participants were sent links to the material with ten short interviews (5 truthful and 5 deceptive) and a questionnaire. During the experiment, all participants were recommended to use headphones and the blind subjects were asked to use computers equipped with screen readers. The blind participants (B) listened to the recordings of the interviews and they were asked to choose on their computer screen whether the person was lying or telling the truth. Next, they were also asked to indicate their level of confidence on a 5-point Likert scale (from 1 meaning "I have no idea" to 5 meaning "I am perfectly confident"). They could play the recordings as many times as they liked before making the final decision and there was no time limit for the completion of this task.

Sighted participants were randomly divided into two relatively equal groups ($n1 = 24$ and $n2 = 23$). One of these groups (S1) received links to clips with the recorded interviews which they were asked to watch, while the other group (S2), similar to the blind participants, received links to the audio-recordings. The procedure and the material was identical to these used with the blind participants.

RESULTS

The participants of the study were tested on their abilities to discriminate between deceptive and truthful utterances of the interviewees. For each correct recognition they received 1 point. In order to ascertain whether the blind and sighted groups differed in lie and truth detection, the total scores in the three groups of participants were calculated and statistically analysed using the SPSS computer programme. Prior to performing statistical analyses preliminary assumption testing was conducted. No violations to the assumptions of normality were found in groups B and S2 (the Shapiro–Wilk test: $F = .91$, $p = .28$; $F = .95$, $p = .09$), but the data values in the group S1 were slightly skewed ($z = –1.21$) and therefore differed from normality (the Shapiro–Wilk test: $F = .87$, $p = .005$*). The Levene's test for equality of variances was also performed and no violations were found for the present analysis ($F = 2.16$, $p = .12$).

The one-way ANOVA was performed to compare the total scores in the three groups. The analysis revealed no significant differences in the accuracy of judgements between the group of blind and the groups of the sighted participants ($F(2, 57) = .759$, $p = .473$). Descriptive statistics are provided in table 2. Overall, all three groups performed slightly above chance level providing 58% (S1), 60% (S2), and 64% (B) of correct responses.

Table 2. Accuracy of veracity judgements and mean scores with standard deviations for blind and sighted groups (all utterances).

	Blind	**Sighted**	
		S1	**S2**
Mean	6.36	5.83	6.04
SD	1.97	1.37	1.62
Accuracy	64%	58%	60%

Next, the scores for correct judgements of deceptive and non-deceptive utterances were separately calculated. The group S1 correctly identified 56% of deceptive and 57% of non-deceptive utterances. The group S2 correctly judged 50% of deceptive utterances, but was more successful in judging non-deceptive utterances reaching 70% accuracy. The blind participants reached respectively 61 and 65% accuracy in judging deceptive and non-deceptive utterances. The mean scores are given in table 3.

Table 3. Accuracy of lie detection and truth detection with descriptive statistics in the blind and sighted groups.

	Blind		**Sighted**			
			S1		**S2**	
	M (*SD*)	Accuracy	*M* (*SD*)	Accuracy	*M* (*SD*)	Accuracy
Lie detection	3.00 (0.81)	61%	2.75 (1.18)	56%	2.54 (0.93)	50%
Truth detection	3.36 (1.38)	65%	3.08 (1.21)	57%	3.50 (1.18)	70%

The 3x2 factorial ANOVA was conducted with group (S1, S2, B) as a between-subject factor and type of utterance (lie, truth) as a within-subject factor. The analysis revealed no interaction between groups and utterance-type ($F(2, 126) = 1.11$, $p = .33$). There was no main effect for group ($F(2, 126) = .72$, $p = .59$), but the main effect for utterance-type was significant ($F(2, 126) = 7.87$, $p = .006$*). For this reason, paired samples t-tests were conducted in each of the groups in order to determine whether the participants within the groups differed in recognition of truths or lies. The analyses revealed that there were no statistically significant differences in the detection of lies and truths in the groups S1 and B ($t = .828$, $p = .416$; $t = 1.44$, $p = .167$). However, the differences were found in the group S2 which was more successful in detecting truths than lies ($t = 3.43$, $p = .002$*).

In the analysis we also wanted to determine whether the blind and sighted groups differed in how confident they were in making veracity judgements. In particular we wanted to ascertained whether deceptive and truthful utterances were judged with different confidence by the groups. The mean confidence levels for deceptive and truthful utterances were separately calculated for all three groups. The mean values for the groups are given in table 4.

Table 4. Mean levels of confidence in the groups of blind and sighted participants detecting lies and truths.

		Blind	**Sighted**	
			S1	**S2**
Confidence	Lie detection	*M* = 3.93 (*SD* = .69)	*M* = 3.97 (*SD* = .41)	*M* = 3.91 (*SD* = .71)
	Truth detection	*M* = 3.85 (*SD* = .66)	*M* = 3.69 (*SD* =.61)	*M* = 3.91 (*SD* = .75)

The data were entered into the factorial ANOVA with group (S1, S2, B) as a within-subject factor and type of utterance (lie, truth) as a within-subject factor. No main effects for group ($F(2, 126) = .16$, $p = .84$) or for utterance type ($F(2, 126) = 1.04$, $p = .30$) were found. There was also no interaction between groups and the utterance type ($F(2, 126) = .32$, $p = .72$).

DISCUSSION

This article was aimed to investigate the differences between blind and sighted adults in lie and truth detection during natural everyday communication. More specifically, it was intended to explore whether the information people with visual impairment are provided with during a conversation allows them to recognise a speaker's deceptive or truthful intentions comparably to people with normal vision.

In the present study all three groups performed at or above chance level reaching between 50 and 70% of correct identifications of true and deceptive utterances. The scores show that the recognition of a speaker's actual intentions, feelings and beliefs may be equally difficult for both blind and sighted individuals. The analysis also shows that people who are blind or who do not have access to visual cues are equally able to detect lies and truths as people who have unlimited access to the information. This suggests that available auditory, vocal and verbal cues allow people who are blind to distinguish between truths and lies comparably to people who are sighted. This may also point to their compensatory skills which have been documented in literature. The present exploratory study did not provide answer to the question which of the available cues visually impaired people considered most useful or misleading in making their judgements. For this reasons, future studies should

concentrate on investigating what cues blind people associate with lying and truth-telling, and whether in this area there are any differences between the blind and the sighted. It is also necessary to explore whether lie detection training would improve the performances of the blind and sighted people

The next important observation from the study was that there are no statistically significant differences between the groups in the detection of lies and truths. The correct responses within the groups B and S1 did not differ irrespective of the type of utterance (true vs. false), but statistically significant differences were found within the group S2, which provided significantly more correct answers when interpreting true utterances. This may suggest that people who are sighted heavily rely on visual cues, and if the cues are not accessible they are more cautious when judging utterances as dishonest, because they do not feel they have enough proof to claim someone is lying. For this reason, they have the tendency to interpret utterances as true.

Finally, the study reveals that the confidence level in all three groups was relatively high, this was irrespective of the type of utterances the groups interpreted. This finding shows that people who are blind are as confident in making veracity judgements as the sighted and they do not feel the information they are provided with is to any extent inadequate or impoverished, or that they miss out on an important part of speech as they are unable to observe the speaker's behaviour. This again confirms that people with visual impairment are as competent participants of communication as the sighted ones.

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LIE DETECTION AND BLINDNESS: RESEARCH IN PANDEMIC TIMES

S u m m a r y

The aim of this article is to explore the differences in lie detection between sighted and visually impaired people. In the study, three groups of blind and sighted individuals were tested on their lie-detecting abilities during natural everyday communication. Due to the current pandemic situation, the study was conducted in accordance with the sanitary regime, using appropriate methods and tools. The results revealed no statistically significant differences between blind and sighted individuals in the accuracy of lie and truth detection. The groups did not differ in how confident they were in making veracity judgements either. The study shows that visual impairment does not have an impact on lie-detection abilities and that blind people are as good at detecting lies as sighted individuals.

Keywords: communication; lie; deception; blind; visual impairment.

NIEPEŁNOSPRAWNOŚĆ WZROKOWA A ROZPOZNAWANIE KŁAMSTWA: BADANIA W DOBIE PANDEMII

S t r e s z c z e n i e

Artykuł dotyczy mało rozpowszechnionego tematu wpływu dysfunkcji wzroku na zdolność odróżnienia wypowiedzi prawdziwych i fałszywych podczas codziennej komunikacji. Celem artykułu jest zbadanie różnic między osobami widzącymi i niewidomymi w ocenie wypowiedzi pod względem ich prawdziwości na podstawie dostępnych dla nich informacji. Ze względu na panującą sytuacją pandemiczną, badanie przeprowadzono z zachowaniem reżimu sanitarnego i przy pomocy odpowiednio dobranych narzędzi i metod badawczych. Wykonane badanie z udziałem osób niewidomych oraz osób widzących pozwala stwierdzić, że osoby niewidome nie różnią się od osób widzących pod względem skuteczności wykrywania wypowiedzi prawdziwych i fałszywych. Przeprowadzona analiza wskazuje, że dysfunkcja wzroku nie ogranicza zdolności osób niewidomych do poprawnego rozpoznania intencji osoby mówiącej.

Słowa kluczowe: komunikacja; kłamstwo; fałsz; niewidomi; dysfunkcja wzroku.