

## Atypical behaviours found in some mental health conditions negatively affect judgments of deception and credibility

Alliyza Lim , Robyn L. Young  and Neil Brewer 

College of Education, Psychology, and Social Work, Flinders University, Adelaide, South Australia, Australia

### ABSTRACT

**Objective:** Unusual behaviours are commonly perceived to indicate deception and low credibility. However, they may also characterise individuals with certain mental health or developmental conditions, thus making those individuals vulnerable to negative judgements. We examined the effect of four behaviours – gaze aversion, body movements, monologuing, and flat affect – on judgements of deception and credibility.

**Method:** In an online experiment, we presented participants (N = 392) with videos of actors being interviewed about their involvement in stealing money. In each video, the actor was either instructed to display one of the four behaviours or was not instructed to display any particular behaviour (control condition). Participants were then asked to provide ratings of perceived deception and credibility.

**Results:** There were significant effects of body movements and monologuing on perceived deception, and significant effects of monologuing and flat affect on the specific credibility dimension of perceived caring. Gaze aversion did not have a statistically significant effect on perceived deception or credibility.

**Conclusion:** Body movements, monologuing, and flat affect negatively affected deception and credibility judgements. Populations who commonly display these behaviours, such as individuals with certain mental health or developmental conditions, may be vulnerable to unfair evaluations in the criminal justice system.

### KEY POINTS

#### What is already known about this topic:

- (1) Based on self-report measures, unusual behaviours are widely believed to be indicators of deception and low credibility.
- (2) There is no empirical evidence that behavioural cues are reliable indicators of deception or credibility.
- (3) Gaze aversion, repetitive body movements, monologuing, and flat affect are common among individuals with certain disabilities and mental health conditions.

#### What this paper adds:

- (1) This study provides experimental support for the effect of repetitive body movements, monologuing, and flat affect on judgements of deception and credibility.
- (2) Individuals who present with repetitive body movements, monologuing, or flat affect due to a disability or mental health condition may be subject to unjust evaluations of deception and credibility.
- (3) There is an important need for further research on how individuals with disabilities and mental health conditions are perceived in the criminal justice system.

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There is a widespread belief that it is not what people say, but instead how they behave when they say it, that indicates guilt and deception. In a study involving 75 countries, The Global Deception Research Team (2006) asked participants from 58 countries the open-ended question, “How can you tell when people are lying?” Of the nine most prevalent beliefs about deception, seven were related to behavioural cues (i.e., gaze aversion, incoherence, body movements, facial

expression, speech fillers, facial colour, and pauses), one was related to overall demeanour (i.e., nervousness), and only one was related to the content of the message (i.e., inconsistency). Respondents thus overwhelmingly cited behavioural cues rather than the content of the message. These findings are in line with other studies showing that behavioural cues such as gaze aversion and body movements are believed to be signs of deception (e.g., Delmas et al.,

2019; Granhag et al., 2004; Marksteiner et al., 2012; Vrij et al., 2006) and also influence judgements of deception (e.g., Au & Wong, 2019; Bogaard & Meijer, 2020; Einav & Hood, 2008; Kraut & Poe, 1980; Slessor et al., 2012; Stiff et al., 1989; Willis & Wrightsman, 1995). It may therefore surprise many that there is currently no empirical evidence that these behaviours are reliable indicators of deception (DePaulo et al., 2003; Luke, 2019; Mann et al., 2012, 2013; Sporer & Schwandt, 2007; Vrij, 2019).

While the use of unreliable cues in deception detection is concerning in itself, the widely held association between unusual behaviours and perceptions of deception is likely to be particularly problematic for individuals with disabilities or mental health conditions, who present with atypical behaviours consistent with their disability. For example, difficulty maintaining eye contact is often seen in individuals with social anxiety and social communication disorders. Rather than resulting from guilt or avoidance, gaze aversion among individuals with these conditions may reflect a fear of social interactions or an impairment in non-verbal communication skills. Likewise, repetitive body movements may be forms of self-stimulatory behaviour among individuals with neurodevelopmental disorders, such as autism (Kapp et al., 2019), fragile X syndrome (Oakes et al., 2016), and Rett syndrome (Goldman & Temudo, 2012). Autistic adults have described self-stimulatory behaviours (e.g., finger flicking, hair pulling, playing with objects) to be soothing and calming, helping them to regulate their emotions in times of stress or sensory overload (Kapp et al., 2019). However, to a naïve observer, such body movements may be misinterpreted as signs of nervousness or guilt. Also common among individuals with neurodevelopmental disorders is topic perseveration, in which individuals repeatedly and excessively bring up a topic of interest, regardless of its relevance to the current focus of the conversation (Friedman et al., 2018; Martin et al., 2012). This may again appear suspicious to observers and, in a criminal justice context, may be viewed as an attempt to avoid answering questions by feigning ignorance.

Emotional expressions are another commonly used indicator of trustworthiness, with studies showing that both victims and defendants are perceived to be more credible when they display negative emotions (e.g., crying) in court compared to neutral (e.g., flat affect) or positive (e.g., smiling) emotions (Ask & Landström, 2010; Kaufmann et al., 2003; Wessel et al., 2012). Unfortunately, blunted affect and apathy are prevalent among individuals with schizophrenia (American Psychiatric

Association, 2013; Winograd-Gurvich et al., 2006), depression (Gehricke & Shapiro, 2000; Guessoum et al., 2020), and even Parkinson's disease (Bowers et al., 2006; Sotgiu & Rusconi, 2013), and can also be a side effect of psychotropic medications (Szmulewicz et al., 2016). The misinterpretation of these behaviours as signs of deception has the potential to cause detrimental consequences in situations such as a police interview or court trial (see Denault & Jupe, 2018; Porter & ten Brinke, 2009; Vrij & Turgeon, 2018).

Despite the lack of supporting empirical evidence, the stereotype that liars display distinctive behavioural cues is widely held, even by presumed "lie-experts" such as police officers, customs officers, prosecutors, and judges (Bogaard & Meijer, 2018; Bogaard et al., 2016; Delmas et al., 2019; Strömwall & Granhag, 2003; Vrij et al., 2006). Attribution theories (Kelley, 1967) may help explain why this is the case. Attribution theories are based on the premise that individuals inherently seek to understand and explain observed behaviours and will rely on their knowledge of the person and situation to attribute a cause to the behaviour (Kelley, 1967). Applying these principles to the area of deception judgements, Levine et al. (2000) and Bond et al. (1992) proposed the norm-violation and expectancy-violation models of deception judgements, respectively. According to these models, non-verbal behaviours that are unexpected (Bond et al., 1992) or unusual (Levine et al., 2000) attract attention and prompt the observer to attribute an explanation to the behaviour. For example, there is a strong association between eye contact and the expectation of active communication, with infants as young as six months old perceiving eye contact as an indicator of the intent to communicate (Senju & Csibra, 2008). Therefore, when an individual does not conform to the social norm of maintaining eye contact during an interpersonal interaction, the observer is prompted to search for an explanation for this anomaly – and one possible explanation that may arise is that the individual is being deceptive. The authors argue that any behaviour that is incongruent with social norms (Levine et al., 2000) or the observer's expectations (Bond et al., 1992) can lead the observer to infer deception as a means of explaining the atypical or unexpected behaviour. However, if behaviours such as gaze aversion, repetitive body movements, monologuing, and flat affect negatively affect perceptions of deception and credibility, individuals with disabilities or mental health conditions that are often associated with such behaviours may be at a disadvantage within the criminal justice system and subject to unfair evaluations.

## The present study

We examined the effect of four behavioural cues – gaze aversion, repetitive body movements, monologuing, and flat affect – on judgements of deception and credibility of an individual being questioned about their involvement in stealing money from a psychology lab. We selected these behaviours as they are (a) commonly perceived indicators of deception and credibility and (b) are often observed in individuals with certain mental health conditions or developmental disorders. Consistent with the expectancy-violation model of deception judgements (Bond et al., 1992), we hypothesised that individuals who display gaze aversion, repetitive body movements, monologuing, or flat affect would be perceived as more deceptive and less credible than those who do not.

We operationalised credibility according to the conceptualisation proposed by McCroskey and Teven (1999), in which credibility comprises three dimensions: competence, caring, and character. Competence refers to the ability, expertise, and intelligence of an individual, character refers to the trustworthiness of an individual, and caring refers to an individual's goodwill and positive intention towards another (Dunleavy et al., 2010; McCroskey, 1971). We argue that all three dimensions are distinct facets of credibility and are each relevant to different types of interpersonal judgements. For example, competence is an important factor in evaluating the reliability of an eyewitness's testimony, while the dimension caring may have a stronger influence on evaluations of a defendant's remorse – both of which are common tasks faced by judges and jurors in a courtroom.

## Method

### Design

A single-factor between-subjects design was used, with behavioural cue as the independent variable with five levels: gaze aversion, repetitive body movements, monologuing, flat affect, and control condition. To avoid any potential order effects, participants were randomly presented with only one dependent measure of interpersonal judgements: perceived deception or perceived credibility.

### Participants

Participants were 531 adults recruited from either a university or the online crowdsourcing platform

TurkPrime (Litman et al., 2017). One hundred and thirty-nine participants failed to pass stringent attention checks, and the data from these participants were excluded from the analysis. The final sample consisted of 392 participants (245 female, 143 male, four preferred not to indicate their gender), ranging in age from 18 to 84 years ( $M = 37.81$ ,  $SD = 10.94$ ,  $Mdn = 36.69$ ). With an alpha level of .05 and power of .80, it was estimated that a minimum sample size of 196 participants would be required to detect a medium effect ( $f = .25$ ) in a one-way independent ANOVA with five conditions (G\*Power 3.1; Faul, Erdfelder et al., 2007). As participants completed only one of the deception or credibility measures, a total sample of 392 was targeted and obtained.

## Materials

### Perceived motive to deceive

To introduce the stimulus videos, participants were presented with the following paragraph: "You will be shown a short video segment of an individual being interviewed. The person you are about to see participated in a psychology experiment about lying. Upon arrival at the lab, they were asked to complete a short computer-based task. Before the task began, an envelope containing \$20 was placed in front of them. They were told that they could take the money at any time, but that at the end of the study, they would be interviewed by a separate researcher who would attempt to determine if they had taken the money. If they took the money but could successfully convince the interviewer that they did not (i.e., they lied and got away with it), they would receive \$50 for participating in the study. If they took the money and were caught by the interviewer (i.e., they lied but were caught out), they would only receive \$10 for participating in the study. If they chose not to take the money, they would receive \$20 for participating in the study, irrespective of whether they were judged as lying or being truthful. The person was given until the end of the computer task to decide whether to take the money or not. After the computer task was over, the person was directed to a separate room where the recorded interview took place."

### Manipulation check: perceived motive to deceive

To ensure that participants had attended to and understood the information provided, participants were asked to, "Please match each possible outcome with the respective payment (drag and drop)." The possible outcomes listed were: "Took the money but successfully convinced the interviewer they did not (i.e., lied and got away with it)," "Took the money and got

caught by the interviewer (i.e., lied but were caught out),” and “Did not take the money.” The possible payment amounts listed were: \$10, \$20, and \$50.

### Stimulus videos

Six professional actors (3 female, 3 male) ranging in age from 19 to 65 years were involved in the production of the stimulus videos. The actors were asked questions about the envelope in the room (e.g., “In the room, there was an envelope. Did you see this envelope?”), what they did (e.g., “Can you describe what you did after the researcher left the room?”), and whether they took the money (e.g., “Did you take the money that was in the envelope?”). In all cases actors were told not to take the money so that they were in fact telling the truth. Each actor completed the same interview five times (for a total of 30 stimulus videos), and each time, they were asked to display one of five conditions of behaviour (see Table 1). Stimulus videos for a sixth condition, misinterpretation of figurative language, were also developed, as this behaviour could be perceived as an evasive response. However, a pilot study revealed that the manipulation of misinterpretation of figurative language in these videos was unsuccessful (see Supplemental Materials, pp. 1–8); thus, this condition was subsequently excluded from the study.

To minimise the variation in verbal content between videos, the actors were provided with a standardised script of how they should respond to the interview questions. The same script was used across all conditions of behaviour, with the exception of the monologuing condition. In the monologuing condition, the script required actors to provide additional irrelevant information about palm trees to approximate an individual talking excessively about a topic of interest. To provide the actors with an appropriate context to display this behaviour, a picture of a tropical island with palm trees was set as the desktop image on the computer that was used for the computer task prior to the interview. The resultant videos were between two and four minutes long. Further details on the development and pilot testing of these

stimulus videos are presented in Supplemental Materials (pp. 1–8).

### Perceived deception

Perceived deception was measured with two questions, “Do you think the person in the interview was telling the truth?” and “Do you think the person in the interview took the money?” Participants provided their responses on 6-point Likert scales from 1 (*deceptive*) to 6 (*truthful*) and 1 (*yes*) to 6 (*no*), respectively. Given that all actors reported that they did not take the money, an answer of “yes” to the question, “Do you think the person in the interview took the money?” indicated that the observer perceived that the individual had not been truthful. There was a high correlation between responses to the two questions ( $r = .91$ ,  $p < .001$ ), and thus, responses from both questions were summed to obtain an overall score of perceived deception ranging from two to 12.

### Perceived credibility

Participants were asked to rate the perceived credibility of the target individual using a modified version of McCroskey and Teven's (1999) 18-item measure of source credibility. This measure of source credibility comprises three dimensions: competence, caring, and character. Items on this measure were rated on a 7-point semantic differential scale, with higher scores indicating higher levels of perceived credibility. Sample items include “incompetent/competent,” “self-centred/not self-centred,” and “untrustworthy/trustworthy.” Three items within the Caring subscale were adapted to improve the relevance of the items to the present context (e.g., “cares about me/doesn't care about me,” was modified to “cares about the interviewer/doesn't care about the interviewer”). The instructions for completing the measure were also slightly modified to better suit the purpose of the present study: “Please indicate your impression of the person noted below by circling the appropriate number between the pairs of adjectives below. The closer the number is to an adjective, the more certain you are of your evaluation,” was modified to “Please indicate your impression of the person in the interview by

**Table 1.** Operationalisation of conditions of behaviour.

Condition of Behaviour	Operationalisation
Gaze Aversion	The individual gazed downward or to either side throughout the interview.
Repetitive Body Movements	The individual displayed repetitive body movements or use of objects that were not required to meet the demands of the interview and did not appear to serve a functional purpose (e.g., fidgeting, rocking, scratching).
Monologuing	The individual talked continuously and in great detail about a particular topic of interest (palm trees) that was irrelevant to the question asked by the interviewer.
Flat Affect	The individual displayed minimal facial expression and vocal intonation throughout the interview.
Control Condition	The individual was not instructed to display any particular nonverbal behaviour.

selecting the appropriate point between the pairs of adjectives below. The closer the number is to an extreme, the more accurate you consider that description to be.”

In a prior examination of the model fit (Lim, 2020), confirmatory factor analyses (CFA) using maximum likelihood (ML) estimation indicated that the hypothesised three-factor model was a poor fit for the data, and thus, respecification of the model was pursued through post hoc adjustments. The resulting best-fit model consisted of five items from the Competence subscale, three items from the Caring subscale, and six items from the Character subscale. This model was therefore used in the operationalisation of perceived competence, caring, and character for this study (see Table 2).

### Awareness of cues used

To assess whether participants were aware of the effect of the manipulated behaviours on their ratings of deception and credibility, participants were asked the open-ended question, ‘Briefly explain the reason(s) for your impression. If you are unsure, please enter “unsure”.’

### Behaviourally anchored rating scales (BARS)

Four behaviourally anchored rating scales (BARS) were used to measure the degree to which participants perceived the target individuals to have displayed each of the four behaviours being investigated: gaze aversion, repetitive body movements, monologuing, and flat affect. The BARS used in the present study were all 4-point scales, with higher ratings indicating more socially appropriate behaviour (see Supplemental Materials, pp. 9–10). The order of presentation of the scales was randomised for each participant.

### Attention checks

Two attention checks were included in a demographic questionnaire that was administered prior to the study. In the first attention check, participants were asked to, “Please select the second option from the top (i.e., option ‘3 –4’)” from a list of six options. In the second attention check, participants were asked to, “Please

spell the word ‘WORLD’ backwards (no spaces or punctuation).” A third attention check was presented at the end of the study, in which participants were asked to identify what happened at the end of the video from a list of five options. It was determined a priori that data from participants who failed to pass any of these three attention checks would be excluded from the analysis, as would participants who failed to watch the entire stimulus video (as indicated by the duration of time spent on the page of the online survey), completed the study in less than one third of the median duration of completion of the current sample, indicated suspicion that the target individual was an actor, or experienced significant technical difficulties. These attention checks were necessary to ensure that all participants adequately attended to the instructions and materials presented, thus reducing the likelihood that the results would be influenced by participant error.

### Procedure

The experiments were presented through an online survey platform (Qualtrics, Provo, UT). To avoid response bias, participants were not initially informed of the full purpose of the study but were instead told that the study aimed to investigate deception detection accuracy. Participants were informed that they were about to be shown a video of an individual being interviewed and were presented with a short paragraph detailing the context of the interview. To ensure that participants had attended to and understood the information provided, a manipulation check was conducted. Participants who failed to pass the manipulation check were presented with the information again. The same manipulation check was then repeated. It was determined a priori that data from participants who failed to pass the manipulation check a second time would be excluded from the analysis. Each participant was randomly presented with a stimulus video from one of the five conditions of behaviour (within each condition, videos from the six actors were randomised evenly). Participants were then randomly allocated to complete either the

**Table 2.** Operationalisations of perceived competence, caring, and character.

Variable	Operationalisation
Perceived Competence	The sum of scores on items 1, 3, 4, 5, and 6 of the Competence subscale of McCroskey and Teven's (1999) measure of source credibility, with higher scores indicating higher levels of perceived competence.
Perceived Caring	The sum of scores on items 1, 2, and 4 of the Caring subscale of McCroskey and Teven's (1999) measure of source credibility, with higher scores indicating higher levels of perceived caring.
Perceived Character	The sum of scores on all items of the Character subscale of McCroskey and Teven's (1999) measure of source credibility, with higher scores indicating higher levels of perceived character.

measure of perceived deception or the measure of perceived credibility. Participants were also asked to briefly describe the reasons for their impression. Using the BARS, participants were then asked to rate the degree to which the individual in the video displayed each of the four behaviours being investigated. Participants were also asked to complete several other measures that were included as part of a broader investigation. Participants were debriefed on the true purpose of the study at the end of the experiment.

## Results

### Manipulation check: behaviourally anchored rating scales (BARS)

To examine whether the intended behavioural cues were noticed by participants, four Kruskal-Wallis tests with Bonferroni correction were conducted, with condition of behaviour as the independent variable and ratings of perceived gaze aversion, repetitive body movements, monologuing, and flat affect as the dependent variables, respectively. Examination of the values of skewness and kurtosis revealed that the distributions deviated substantially from normality; thus, non-parametric tests were used for data analysis. Effect sizes were calculated using formulae by Lenhard and Lenhard (2016). There was a statistically significant difference between the five conditions in ratings of perceived gaze aversion,  $\chi^2(4) = 192.13$ ,  $p < .001$ ,  $\eta^2 = .49$ , repetitive body movements,  $\chi^2(4) = 163.10$ ,  $p < .001$ ,  $\eta^2 = .41$ , monologuing,  $\chi^2(4) = 217.45$ ,  $p < .001$ ,  $\eta^2 = .56$ , and flat affect,  $\chi^2(4) = 106.14$ ,  $p < .001$ ,  $\eta^2 = .26$ . For each behavioural cue, multiple comparisons were then carried out using four Mann-Whitney  $U$  tests with Bonferroni correction to examine whether the target

individuals were rated as demonstrating significantly higher levels of the intended behaviour for videos in the respective condition compared to videos in each of the other four conditions. A summary of these findings is shown in Table 3. Taken together, the results suggest that the manipulations of the behavioural cues were successful.

## Hypothesis testing

### Perceived deception

An independent one-way ANOVA with behaviour as the independent variable and perceived deception as the dependent variable was conducted. The results indicated a significant difference in ratings of perceived deception between the five conditions,  $F(4, 192) = 4.39$ ,  $p = .002$ ,  $\eta_p^2 = .08$ , 90% CI [.02, .14]. Multiple comparisons using Dunnett's test revealed that the target individuals were rated as more deceptive when they displayed repetitive body movements or monologuing than when they did not display any of the behavioural cues. Gaze aversion and flat affect did not significantly affect ratings of perceived deception (see Table 4).

### Perceived credibility

Ratings of perceived competence, caring, and character were found to be significantly correlated,  $r_s = .26-.60$ ,  $p < .001$ . An independent one-way MANOVA indicated that, using Wilk's lambda, there was a significant effect of behaviour on judgements of credibility,  $\Lambda = .85$ ,  $F(12, 495.05) = 2.54$ ,  $p = .003$ ,  $\eta_p^2 = .05$ , 90% CI [.01, .07]. Follow-up univariate analyses indicated that there were no significant differences in ratings of perceived competence,  $F(4, 189) = 1.38$ ,  $p = .24$ ,  $\eta_p^2 = .03$ , 90% CI [0, .06], or character,  $F(4, 189)$

**Table 3.** Differences in level of perceived behaviour between the intended condition and all other conditions.

Condition of Behaviour	Perceived Gaze Aversion		Perceived Body Movements		Perceived Monologuing		Perceived Flat Affect	
	$U$	$\theta$ [95% CI]	$U$	$\theta$ [95% CI]	$U$	$\theta$ [95% CI]	$U$	$\theta$ [95% CI]
Gaze Aversion	-	-	647.00***	.11 [.07, .18]	483.00***	.08 [.04, .13]	1712.50***	.29 [.21, .37]
Repetitive Body Movements	342.50***	.06 [.03, .11]	-	-	292.50***	.05 [.02, .10]	992.50***	.17 [.11, .24]
Monologuing	383.00***	.06 [.03, .11]	485.00***	.08 [.05, .14]	-	-	937.00***	.15 [.10, .22]
Flat Affect	78.50***	.01 [.004, .05]	234.00***	.04 [.02, .09]	222.50***	.04 [.02, .08]	-	-
Control Condition	177.00***	.03 [.01, .07]	516.00***	.09 [.05, .15]	316.00***	.05 [.02, .10]	835.50***	.14 [.09, .21]

Note. Effect sizes were calculated based on the method by Newcombe (2006), where  $\theta$  represents the degree of overlap between the values of the two samples. Values of  $\theta$  range from 0 to 1, with 0 and 1 indicating no overlap and .5 indicating identical distributions. Each column shows the mean difference in ratings of the specified behaviour between the intended condition and each of the other four conditions.

\*\*\* $p \leq .001$ .

**Table 4.** Effect sizes and confidence intervals for the effect of behaviour on perceived deception and credibility.

Behaviour	Deception	Competence	Caring	Character
	<i>d</i> [95% CI]	<i>d</i> [95% CI]	<i>d</i> [95% CI]	<i>d</i> [95% CI]
Gaze Aversion	0.30 [-.15, .74]	0.27 [-.18, .72]	0.18 [-.26, .63]	0.28 [-.17, .73]
Repetitive Body Movements	0.70** [.24, 1.15]	0.14 [-.31, .60]	0.31 [-.14, .77]	0.12 [-.33, .57]
Monologuing	0.53* [.09, .98]	-.22 [-.66, .22]	0.68** [.23, 1.13]	0.36 [-.09, .80]
Flat Affect	-.04 [-.48, .39]	0.15 [-.31, .61]	0.67* [.20, 1.14]	0.16 [-.30, .62]

Note: \* $p \leq .05$ , \*\* $p \leq .01$

= .77,  $p = .55$ ,  $\eta_p^2 = .02$ , 90% CI [0, .04], between the five conditions. However, there was a significant effect of behaviour on ratings of perceived caring,  $F(4, 189) = 3.76$ ,  $p = .006$ ,  $\eta_p^2 = .07$ , 90% CI [.01, .12]. Multiple comparisons using Dunnett's test revealed that the target individuals were rated as less caring when they displayed monologuing or flat affect than when they did not display any of the behavioural cues (see Table 4).

### Awareness of cues used

Participants' qualitative descriptions of the reasons for their impression were also examined to gain an understanding of whether participants were aware that the behavioural cues had influenced their judgements of deception and credibility. Given that only repetitive body movements and monologuing had significant effects on perceived deception, and monologuing and flat affect on perceived caring, only the responses from participants in these conditions are presented. Each response was sorted into one of four categories: manipulated behaviour, other behaviour, overall impression, and unsure. Any response that included the manipulated behaviour was categorised as "manipulated behaviour" regardless of whether other cues were also listed. Responses that did not include the manipulated behaviour but mentioned at least one other specific behaviour (e.g., "she was hesitating," "the subject said 'um' a lot," "her posture was slightly slouched") were categorised as "other behaviour." Responses that referred to an overall perception of the individual without mention of any specific behaviours were categorised as "overall impression" (e.g., "he seemed honest and genuine," "she seems nervous," "just from the way she acted," "my gut feeling"). The findings suggested that while the majority of participants in the repetitive body movements and

monologuing conditions were aware that these behaviours had influenced their judgements of deception, participants who were asked to provide ratings of credibility were less likely to acknowledge the effect of the manipulated behaviours on their impression of the individual in the video (see Table 5).

### Discussion

The results of this study revealed significant effects of repetitive body movements and monologuing on perceived deception, and significant effects of monologuing and flat affect on the credibility dimension of perceived caring. This is noteworthy as it could have significant practical implications for individuals who commonly display such behaviours: for example, individuals with schizophrenia or mood disorders who may have blunted affect (American Psychiatric Association, 2013; Guessoum et al., 2020), or individuals with neurodevelopmental disorders such as autism who may display motor stereotypies and perseverative speech (American Psychiatric Association, 2013; Goldman & Temudo, 2012; Oakes et al., 2016). However, unexpectedly, gaze aversion did not have a significant effect on judgements of deception or credibility. These findings not only contradict our hypothesis, but also contradict the findings of other similar studies. In a recent study, Bogaard and Meijer (2020) also adopted an experimental approach to examine how stereotypical behavioural cues (i.e., gaze aversion, hand and arm movements, and body movements) influenced observers' judgements of an individual's credibility. Bogaard and Meijer (2020) found that individuals were perceived to be significantly less credible when they displayed these stereotypical behaviours compared to when they did not,

**Table 5.** Percentage of participants who reported the use of each cue (%).

	Perceived Deception		Perceived Credibility	
	Repetitive Body Movements ( <i>n</i> = 39)	Monologuing ( <i>n</i> = 39)	Monologuing ( <i>n</i> = 43)	Flat Affect ( <i>n</i> = 36)
Manipulated Behaviour	69.23	56.41	34.88	27.78
Other Behaviour	23.08	17.95	27.91	27.78
Overall Impression	5.13	17.95	20.93	36.11
Unsure	2.56	7.69	16.28	8.33

with observers citing lack of eye contact as among the top reasons for their judgement. A noteworthy difference between our study and that of Bogaard and Meijer (2020) is that we attempted to examine the effect of each cue individually, while Bogaard and Meijer (2020) examined the presence of multiple cues simultaneously. It is possible that gaze aversion, in isolation, is insufficient to influence judgements of credibility, but has a stronger effect when presented in conjunction with other behavioural cues.

Although our findings are preliminary, they suggest that observers' impressions of deception and credibility are, at least to some extent, influenced by misleading cues, and individuals who display these cues may be at risk of being inaccurately judged negatively. For example, it is possible that the demonstration of one of these behaviours could be the determining factor of whether a jury member perceives a defendant truthful or a judge deems an eyewitness credible. This calls for greater research into cues to perceived deception and credibility.

In the present study, the behavioural cues we examined only influenced the specific credibility dimension of perceived caring, but not the dimensions of competence or character. This suggests the possibility that the cues identified – monologuing and flat affect – may have particular relevance for judgements of credibility in situations where the individual is expected to show care and concern for another. One such situation within the criminal justice system is the demonstration of remorse by defendants during their trial. Remorse is defined as “moral or emotional distress resulting from past transgressions” (Corwin et al., 2012). Remorse is often considered to be a mitigating factor in sentencing decisions as it is thought to signify the defendant's commitment not to recidivate and the start of their progress towards rehabilitation (Corwin et al., 2012). It may be that individuals who display blunted affect (such as those with certain psychotic or mood disorders) or who have difficulty with social reciprocity (such as those with autism or other developmental disorders) are more vulnerable to being judged as less caring or less remorseful, which could affect sentencing outcomes (cf. Foster & Young, 2021). Given the potentially significant adverse consequences of such judgements, replication of these findings is necessary.

The majority of participants in the repetitive body movements and monologuing conditions identified that the respective behaviours had (to some degree) influenced their judgement of deception. However, participants who were asked to provide ratings of credibility were less aware that the behavioural cues had affected their ratings, with only a minority of participants in the monologuing and flat affect conditions indicating that

the respective behaviour had influenced their judgements. This is consistent with research that has shown that individuals are not always conscious of the cues they rely on when forming interpersonal judgements (Kaufmann et al., 2003), and further highlights the need for experimental research on factors that may subliminally influence perceptions of deception and credibility.

### *Limitations and future directions*

A notable limitation of this study was that potential moderating factors of the effect of behaviour on judgements of deception and credibility were not considered. The premise of the attribution theory argument for why these behaviours influence judgements of deception and credibility is that the behaviours are unexpected or atypical, thus prompting observers to search for explanations for the behaviour (Bond et al., 1992; Levine et al., 2000). From this, we speculate that, if the individual was in a situation in which it was expected that these behaviours would be displayed, the presence of the behaviours would have no effect, or perhaps even the opposite effect, on judgements of deception and credibility. For example, these effects may be moderated by observer demographics, attitudes, or culture. However, as the examination of potential moderators was not within the scope of this study, this discussion remains speculative and further research in this area is warranted.

It must also be acknowledged that, while the findings of this study suggest that individuals with mental health conditions and developmental disorders may be at greater risk of being judged negatively due to their demonstration of atypical behaviours, this hypothesis was not directly examined in the present study given that actors were employed in the production of the stimulus videos. Although this is a valuable starting point, further research involving members of these populations as the focus of the stimulus materials is necessary. Finally, given that the content of the interview was scripted and that each actor completed the same interview six times (one for each condition of behaviour), it is possible that the responses given in the interviews may have appeared rehearsed, thus confounding participants' perceptions of the individuals' truthfulness and credibility (cf. Hartwig et al., 2007). While only two participants indicated that “scripted” and “somewhat rehearsed” answers were among the reasons for their impression of the individual, future research would nonetheless benefit from the use of more naturalistic methods of stimulus development.

## Conclusion

The results of this study indicate that repetitive body movements, monologuing, or flat affect can negatively affect judgements of deception and credibility. This is concerning as these behaviours are common among individuals with certain mental health and developmental conditions, suggesting that such populations may be vulnerable to unjust evaluations. Further research is thus necessary to replicate the findings among these populations and to identify potential factors that may moderate this relationship.

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This research was conducted as part of A. Lim's doctoral dissertation and the findings were presented at the 2020 conference of the American Psychology-Law Society, New Orleans, LO, USA. The authors report there are no competing interests to declare.

This study was approved by the Flinders University Social and Behavioural Research Ethics Committee (Project No. 8149). All procedures performed were in accordance with the ethical standards of 1964 Helsinki declaration and its later amendments. Informed consent was obtained from all individual participants included in the study.

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## ORCID

Alliyya Lim  <http://orcid.org/0000-0001-7451-6112>

Robyn L. Young  <http://orcid.org/0000-0002-6124-8515>

Neil Brewer  <http://orcid.org/0000-0003-3465-9244>

## Data availability statement

The data from this study are available at <https://osf.io/kmxyg/>

## Open scholarship



This article has earned the Center for Open Science badge for Open Data. The data are openly accessible at <https://osf.io/kmxyg/>.

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