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Use of global trait cues helps to explain older adults' decrements in detecting children's lies

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Purpose. Previous research has established that lie-detection accuracy decreases with age; however, various mechanisms for this effect have yet to be explored, particularly when examining the detection of children's lies. The present study investigated if younger and older adults detect children's lies using different cues (verbal content, verbal auditory, non-verbal, global traits) to explore if cue usage may help to explain this age-related decline.

Method. A total of 100 younger (18–30 years) and 100 older adults (66–89 years) watched child interview videos (half were truth-tellers; half were lie-tellers coached to conceal a transgression). Participants provided veracity judgements (truth vs. lie) and described the cues that they relied on to make their judgements.

Results. Older adults used marginally significantly fewer verbal content and significantly more global trait cues compared to younger adults. The use of global trait cues partially mediated the age-related decline in detection accuracy.

Conclusion. These results present a partial mechanism for the age-related decline in deception detection. This can inform psychological theory on how ageing affects perceptions of child witnesses and deception detection abilities.

Lie-detection research has established that adults are, on average, mediocre lie detectors when attempting to detect children's lies (Gongola, Scurich, & Quas, 2017). In certain settings, such as a legal context, where it is imperative to determine if one's statement is truthful or dishonest, inaccurate lie detection can have serious consequences. For example, when children are victims of abuse, their testimony of the event can be a crucial component of a trial, particularly in sexual abuse cases when there is often no physical evidence (Hershkowitz, Lanes, & Lamb, 2007). Children of abuse may be coached by adults to conceal information of their abuse (Lyon, Carrick, & Quas, 2010; Malloy, Lyon, & Quas, 2007). As such, accurate detection of this coached report becomes critical for protecting the child.

Given the importance of understanding adults' abilities to detect children's lies, research has examined several factors that may influence adults' accuracy, such as parental status (Evans, Bender, & Lee, 2016; Talwar, Renaud, & Conway, 2015), occupation (e.g. Leach, Talwar, Lee, Bala, & Lindsay, 2004), and experience with children

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(e.g. Crossman & Lewis, 2006). An additional factor that may impact adults' lie detection is one's age, as ageing throughout later life is associated with a host of social and cognitive changes that can alter how one perceives social stimuli (e.g. Mather, 2016; Phillips et al., 2011; Ruffman, Henry, Livingstone, & Phillips, 2008). Surprisingly, only one study to date has examined how ageing relates to the detection of children's lies, reporting that older adults (those over the age of 65) are less accurate than younger adults (detected 25% vs. 47% of children's lies, respectively; O'Connor, Lyon, & Evans, 2019). This is consistent with prior research demonstrating that older adults are less accurate than younger adults when detecting younger and older adults' lies (Ruffman, Murray, Halberstaft, & Vater, 2012; Stanley & Blanchard-Fields, 2008; Sweeney & Ceci, 2014; but see Bond, Thompson, & Malloy, 2005), suggesting that this decline in lie-detection accuracy is evident across speaker ages.

Younger and older adults differ in their ability to detect children's lies, yet it is currently unknown *why* this pattern emerges. Notably, Ruffman et al. (2012) found that older adults' reduced lie-detection accuracy (when evaluating adult liars) was mediated by an age-related decline in emotion recognition. Thus, changes in the decoding of emotional expressions is one mechanism for the age-related decline in deception detection. However, no research has explored additional mechanisms for this age decline in accuracy, and no research has explored mechanisms when evaluating children's dishonesty. Deepening our knowledge on mechanisms behind this reduction in accuracy may assist with not only understanding how older adults perceive witnesses but also factors that assist in improving lie detection more broadly. In the present study, we explored if younger and older adults attend to different cues (e.g. verbal and non-verbal cues) from children when detecting their lies and whether this helps to explain differences in their lie-detection abilities.

Examining this research question within the context of ageing is particularly important as the ageing population is expected to double by the year 2030 (USDECA, 2004; Statistics Canada, 2016). Extensive research has examined how younger and middle-aged adults perceive child testimonies (e.g. Bala, Evans, & Bala, 2010) and detect children's deceit (e.g. Gongola et al., 2017), but this line of research has yet to fully understand how this differs as adults advance into the later stages of adulthood (but see O'Connor et al., 2019). Given that maltreated children may feel reluctant to disclose and may provide a coached cover study to conceal maltreatment, it is essential to better understand how older adults perceive this concealment and cover story. For instance, children may conceal abuse when talking to their grandparent(s) or when being interviewed by older police officers, forensic interviewers, or family psychologists. Moreover, in a court setting, children's initial concealment of maltreatment can be introduced at trial in an attempt to impeach the child. As such, accurately detecting when a child is concealing maltreatment is important to help protect the child from further abuse and can help to enhance the child's credibility in the eyes of the judge or the jury. In a jury context, older adults are an important group of potential jurors who show greater interest (O'Connor & Evans, 2020) and are better able to accommodate jury duty into their daily routine (Boatright, 2001) compared to younger age groups. Beyond this increasing availability to serve, ageing and increased life experience can influence juror decision-making (Adams-Price, Dalton, & Sumrall, 2004; Anwar, Bayer, & Hjalmarsson, 2014; Higgins, Heath, & Grannemann, 2007). For example, Anwar et al. (2014) found that the likelihood of a jury convicting an adult defendant systematically increased when the average age of the jury was above 50. Thus, younger and older adults may bring different perspectives in a jury context, yet we have not yet fully explored mechanisms that may underlie these age-related changes

(Brank, 2007). Given the potential for older adults to be involved with and bring a unique perspective to legal proceedings or conversations where maltreatment may be concealed, it is imperative to further explore why younger and older adults differ in their perceptions and accurate classification of children's honest and dishonest testimonies. In the present study, we explored if younger and older adults relied on different cues to detect children's deception and if this predicted their detection accuracy.

Cues to deception

When evaluating testimony and determining if it is truthful or not, one may consider the content of the testimony, body language, or how the witness is behaving to inform their evaluation. In the deception cue literature (e.g. Sporer & Schwandt, 2007; Vrij, Edward, Roberts, & Bull, 2000; Vrij & Mann, 2004), deception cues are often coded into the following categories: verbal content cues (i.e. *what* the person is saying in their report, e.g. consistency, plausibility), verbal auditory (or paraverbal) cues (i.e. *how* the information is provided, e.g. pauses in speech, speech errors), and non-verbal cues (i.e. how the person is behaving, e.g. eye contact, fidgeting). Adults may also rely on global trait cues, such as whether the individual, in general, appears confident or friendly. Though the relation between specific cues and deception tend to produce small effect sizes (Luke, 2019), adults may continue to use various deception cues when detecting lies. Thus, exploring the types of cues used by participants can help us to better understand one's decision-making when detecting a lie. More extensive research has examined cues used to detect adults' lies relative to children's lies; therefore, we first briefly review the adult cue literature before reviewing this within the context of children's deception.

Cues to adults' deception

Several meta-analyses on adult liars have found that some verbal content (i.e. providing negative statements and irrelevant information) and verbal auditory cues (i.e. speech errors, pauses, pitch, response time) can differentiate truth and lie-tellers (DePaulo et al., 2003; Sporer & Schwandt, 2006; Vrij et al., 2000). Sporer and Schwandt's (2007) meta-analysis demonstrated that the majority of non-verbal behaviours are similar across adult truth- and lie-tellers. Thus, there is greater empirical support for the use of verbal compared to non-verbal cues when detecting adult deceit; however, individuals tend to rely on various verbal and non-verbal cues (e.g. stuttering, fidgeting, and eye contact; Slessor et al., 2012) that may not be reliable, likely contributing to adults' unimpressive lie-detection abilities.

A small amount of work has examined whether ageing affects the cues that adults believe are indicators of deception. Slessor et al. (2012) asked younger and older adults to rate how strongly various cues indicate deception. Compared to younger adults, older adults were more likely to believe that liars tell longer stories and use more gestures. Contrary to these beliefs, liars tend to tell shorter stories with fewer gestures compared to truth-tellers (Sporer & Schwandt, 2006, 2007). It is therefore possible that the age-related decline in deception detection is, in part, due to the inaccurate or distracting cues that older adults associate with deceit (Slessor et al., 2012).

There is evidence that older adults are both less accurate at detecting lies (O'Connor et al., 2019; Ruffman et al., 2012; Stanley & Blanchard-Fields, 2008; Sweeney & Ceci, 2014) and use deception cues differently than younger adults (Slessor et al., 2012; Sporer & Schwandt, 2006). Therefore, it is possible that the age-related decline in lie-detection

accuracy can be explained, in part, by the deception cues that younger and older adults rely on to inform their judgements. As no research to date has explored how ageing affects the cues used to detect children's deception, the present study examined the cues that younger and older adults report using to detect children's lies in relation to their detection accuracy.

Cues to children's deception

Adults tend to rely more frequently on verbal compared to non-verbal cues when detecting children's lies (Strömwall & Granhag, 2005; Strömwall, Granhag, & Landström, 2007; Westcott, Davies, & Clifford, 1991). This may be an effective strategy as the ability to conceal incriminating or contradictory information (i.e. semantic leakage control) continues to develop through later childhood and adolescence (Evans & Lee, 2011). In fact, using various linguistic coding programs (e.g. Linguistic Inquiry Word Count; LIWC), significant verbal differences have been found in children's truthful versus dishonest (coached) reports (Williams, Talwar, Lindsay, Bala, & Lee, 2014). Compared to truth-tellers, liars tend to use more first-person pronouns, follow a more logical structure, and use more spatial terms (Williams et al., 2014). Although children are less sophisticated liars who may unwillingly leak various cues to their deceit (Talwar, Crossman, Williams, & Muir, 2011), as with the adult literature, non-verbal cues have not consistently and reliably predicted children's deception (e.g. Talwar & Lee, 2002; but see Talwar, Murphy, & Lee, 2007). However, some recent research examining children's behaviour when questioned using open-ended investigative interview techniques suggests that there may indeed be non-verbal indicators of children's reluctance to disclose sensitive information such as abuse (Katz et al., 2012). Thus, when examining more ecologically valid and high-stakes deception, such as children attempting to conceal maltreatment (Katz et al., 2012), it may be important for adults to consider children's non-verbal behaviours. As with the adult literature, despite the weak associations between specific deception cues and deception detection, adults continue to report using various verbal and non-verbal cues to detect children's lies (e.g. Wyman, Foster, Lavoie, Tong, & Talwar, 2018). Thus, in the present study, we are interested in exploring age differences in the usage of various deception cues to help explain age differences in deception detection.

The present study

The present study analysed the same data set as reported in (O'Connor et al., 2019) along with a previously unreported variable: cues listed for lie-detection judgements. Younger and older adults watched a series of videos of children being interviewed about an event; half depicting children telling the truth and half depicting children who were coached to lie to conceal a transgression. Participants made veracity judgements (whether the child was being truthful or dishonest) and were asked to describe the cues that they relied on to make their decision.

Given that verbal cues are more reliable predictors of detection accuracy (DePaulo et al., 2003; Sporer & Schwandt, 2006; Vrij, Granhag, & Porter, 2010; Zuckerman & Driver, 1985), and that older adults are less accurate when detecting children's lies (O'Connor et al., 2019), we expected that older adults would report using fewer verbal and more non-verbal cues to detect deception compared to younger adults. We also expected that greater use of verbal cues (verbal content and verbal auditory) would predict greater detection accuracy (DePaulo et al., 2003; Sporer & Schwandt, 2006; Zuckerman & Driver,

1985). As the use of global trait cues (i.e. overall assessments of a child's character) has not been used in previous deception cue studies, this cue category was included for exploratory analyses to examine if participants report using global traits when giving veracity judgements and if this differs by age group and detection accuracy. Given that with age, social judgements become more holistic and older adults tend to fare better with more global or top-down processing (Glisky, 2007; Meinhardt-Injac, Perkise, & Meinhardt, 2014), we speculated that older adults would report using more global cues when detecting lies compared to younger adults.

Method

Participants

A total of 100 younger adults (M_{age} = 20.03, SD = 2.42, range = 18–30, 30 males) and 100 older adults (M_{age} = 73.41, SD = 4.72, range = 66-to-89 years, 30 males) participated in the present study. All younger adults were current university undergraduate students. Ninety per cent of younger adults indicated that high school was their highest completed level of education, 9% had completed a college degree, and 1% had completed a postgraduate degree. The ethnicity of the younger adult sample was 79% Caucasian, 6% South Asian, 6% Latin American, 5% Black, 2% East Asian, 1% West Asian, and 1% mixed ethnicity.

Older adults were recruited from local community events and from a database of community members who indicated that they would like to be contacted to participate in research studies. Two per cent of older adults did not complete high school, 25% completed high school, 38% completed college or university, and 35% completed a postgraduate degree. Ninety-two per cent of older adults were retired at the time of the study. The ethnicity of the older adult sample was 98% Caucasian, 1% South Asian, and 1% did not report. Older adults completed the Mini-Mental State Examination (MMSE) to assess general cognitive functioning. Scores on the MMSE range from 0 to 30 with scores under 23 indicating potential cognitive impairment for those with at least a completed high-school education. No older adults showed signs of cognitive impairment (M = 28.41, SD = 1.38); therefore, all participants were included in the analyses.

All participants completed the study in a research laboratory, gave informed consent prior to the study, and were compensated for their participation (younger adults received either course credit or $5 and all older adults received $5). All procedures were approved by the Brock University Research Ethics Board.

Materials

Video stimuli

Participants watched 8 child interviews (M_{age} = 10.13, SD = .835, range = 9–11 years old, 3 males) from a previous study (Evans & Lyon, 2019) where children either provided a truthful report about playing a game with a confederate or a coached fabricated report to conceal a co-transgression. Specifically, half of the videos depicted children in a control condition where, during their interaction with a confederate, they played a computer game (the 'Ball game'). The other half of the videos depicted children in a transgression condition where, during their interaction with a confederate, they played a forbidden computer game (the 'Jewel game') that resulted in the computer crashing and losing important data. These children were then asked to keep this transgression a secret and

were coached to report that they played the 'Ball game' to conceal the fact that they played a forbidden game and crashed the computer. Hence, all children claimed to have played the 'Ball game', but half of them were lying about this to conceal a transgression. The interviews were conducted using a free-recall narrative where the interviewer first asked children to tell them everything they could about what happened. The interviewer followed up with prompts (e.g. tell me more about that. . . tell me what you saw) until the child exhausted his/her narrative. The confederate and interviewer followed standardized scripts to ensure that the coaching and interviews were consistent across participants.

The eight videos were randomly selected based on condition (control *vs*. transgression) and matched for age and sex when possible. Half of the eight videos included children telling the truth about playing the Ball Game (control condition; $M_{age} = 10.25$, $SD = .957$, 1 male) and the other half included children lying about playing the Ball Game (transgression condition; $M_{age} = 10.00$, $SD = .817$, 2 males). The videos were presented in a randomized order with a transcript of the interview provided below each video. The average length of videos was 3.47 min and did not differ across truth and lie-tellers $t(6) = .257$, $p = .806$.

Lie detection

After each video, participants were asked if the child was being truthful or dishonest. The complete lie-detection accuracy analyses are reported in O'Connor et al. (2019). In brief, younger adults were 67% accurate (86% truth accuracy; 47% lie accuracy) and older adults were 57% accurate (90% truth accuracy; 25% lie accuracy). Following the first two videos, participants were also asked to describe two reasons for this veracity judgement (provided in two open-ended response formats). Participants self-generated their own cues. The reporting of these cues is a novel aspect of the current work and has not been previously examined. Obtaining veracity judgements across all 8 videos allowed for multiple trials to assess accuracy while deception cues were reported following the first two videos to reduce the time demands of the study.

Cue coding

Three cue categories were used to code for verbal cues, non-verbal cues, and global trait cues. Verbal cues included two sub-categories: verbal content and verbal auditory (or paraverbal) cues. Verbal content cues represent details about what the child said (e.g. consistency, amount of detail, plausibility), and verbal auditory cues represent how the child said their response (e.g. stuttering, response latency, speech errors). Non-verbal cues refer to body or face movements (e.g. eye contact, fidgeting, gestures, posture shifts). Global trait cues refer to overall assessments of a child's character or demeanour (e.g. nervous, confident, friendly) without indicating a specific response or behaviour. Thus, the verbal and non-verbal cue categories depict specific cues emitted by the child and the global traits category represents broader perceptions or impressions of the child's traits or emotional states.

As participants were given two open-ended response prompts to describe two reasons for each veracity judgement, it was possible that participants could mention various cues within these responses (i.e. participants were not limited to only providing 2 cues or 'words' per video). On average, participants reported a total of 5.19 cues ($SD = 1.50$) across the two videos, and this did not significantly differ across younger ($M = 5.17$, $SD = 1.52$) and older adults ($M = 5.20$, $SD = 1.48$), $t(198) = .141$, $p = .888$.

A research assistant coded participants' cues into the respective cue categories (verbal content, verbal auditory, non-verbal, global traits). The specific cues reported across participants is available in Appendix 1. Summed scores were created for each of the cue categories to calculate the number of times each participant reported using verbal content, verbal auditory, non-verbal, and global trait cues. Next, to assess the extent to which participants relied on various cue types within their responses, each cue sum was divided by the total number of cues that the participant reported. For instance, if a participant reported a total of 5 cues from the videos (3 verbal content, 1 verbal auditory, 0 non-verbal, and 1 global trait), their cue proportion scores are as follows: verbal content (0.6), verbal auditory (0.2), non-verbal (0), global traits (0.2). Higher scores depict greater use of a cue type. A second researcher independently coded 100% of participants' responses, demonstrating good interrater reliability ($\alpha = .78$).

Results

Analytic plan

We conducted three main analyses. First, we examined if younger and older adults differed in the frequency with which they reported using various cues. Second, we explored if reported cue usage was associated with detection accuracy. Third, we examined if reported cue usage mediated the relation between age group and detection accuracy.

Reported deception cues

A one-way multivariate analysis of variance (MANOVA) was conducted with age group (younger *vs*. older adult) as a between-subjects variable and cue proportion scores (verbal content, verbal auditory, non-verbal, global traits) entered as within-subjects dependent variables. There was a statistically significant difference in cue proportion scores based on one's age group, $F(3, 196) = 5.44$, $p = .001$, $\eta_p^2 = .077$. With a Bonferroni correction (alpha set to .0125), univariate tests indicated that younger adults reported using marginally significantly more verbal content cues, $F(1, 198) = 6.10$, $p = .014$, $\eta_p^2 = .030$, and significantly fewer global trait cues, $F(1, 198) = 15.96$, $p < .001$, $\eta_p^2 = .075$, compared to older adults. Younger and older adults did not significantly differ in their reporting of verbal auditory, $F(1, 198) = 2.24$, $p = .136$, and non-verbal cues, $F(1, 198) = .706$, $p = .402$. See Figure 1.

Deception cues and detection accuracy

To examine how skilled participants were at identifying both the presence and absence of a lie, signal detection analyses were conducted to obtain a measure of d prime (d'; see Stanislaw & Todorov, 1999 for further information on signal detection). D′ provides a measure of sensitivity to discriminating between truthful and dishonest stimuli and is calculated by subtracting the proportion of false alarms (misidentifying a truth-teller as a lie-teller) from the proportion of hits (correctly identifying a lie-teller). Higher d' scores represent a greater ability to discriminate between the truth and lie videos. See Table 1 for the correlation matrix between cue proportion scores and detection accuracy (d') scores.

As only global trait and verbal auditory cues were significantly correlated with detection accuracy (Table 1), a hierarchical linear regression was conducted to predict d'

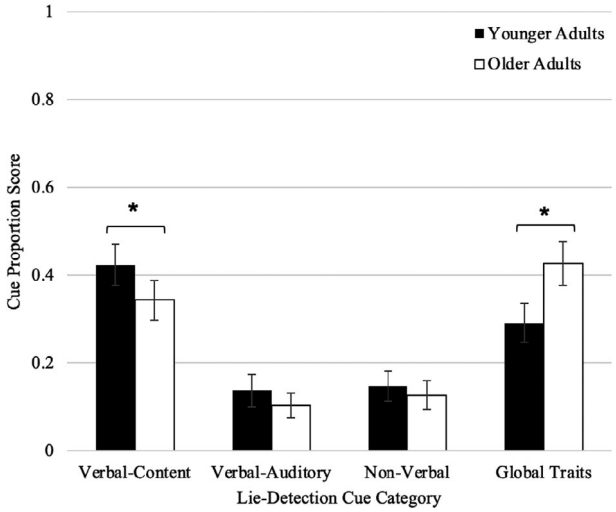

Figure 1. The proportion of times younger and older adults reported using each cue type to inform their lie-detection judgements. Error bars represent 95% confidence intervals. $^{*}p < .05$. When using a Bonferroni correction ($p = .0125$), the age difference in reporting verbal content cues is marginally significant ($p = .0146$).

Table 1. Pearson's correlations between cue proportion scores and *d′* values

	d′	Verbal content cues	Verbal auditory cues	Non-verbal cues	Global trait cues
d′	–				
Verbal content cues	.066	–			
Verbal auditory cues	.180*	−.299**	–		
Non-verbal cues	.128	−.326**	.002	–	
Global trait cues	−.267**	−.524**	−.375**	−.380*	–

Note. $N = 200$; $^{*}p = < .05$; $^{**}p < .001$.

scores with age group (0 = younger adults; 1 = older adults) entered on step 1, verbal auditory and global trait cue proportion scores were converted to z-scores and entered on step 2, and age by z-proportion score interactions entered on step 3. No significant interactions emerged on step 3; therefore, the most parsimonious model is presented without interaction terms. As expected, age group significantly predicted accuracy on step 1, $R = .353, F(1, 198) = 28.10, p < .001$, explaining 12.4% of variability in *d′* scores, such that being classified as an older adult predicted poorer *d′* scores, $t = 5.30, p < .001$, $\beta = -.353$. Together on step 2, age group and cue proportion scores significantly predicted *d′* scores, $R = .404$, F (3, 196) = 12.73, $p < .001$, explaining 16.3% of variability in *d′* scores. Age group remained significant as a unique predictor, $t = 4.44$, $p < .001$, $\beta = -.302$. In addition, the use of global trait cues emerged as a significant unique predictor, $t = 2.07, p = .040, \beta = -.151$, demonstrating that greater use of global trait cues predicted poorer detection accuracy. The use of verbal auditory cues was not a significant unique predictor, $t = 1.29, p = .197, \beta = .091$.

Mediation analysis

Given that younger and older adults differed both in their use of global trait cues and their ability to detect children's lies, and that global trait cues significantly predicted poorer detection accuracy, we conducted a mediation analysis to explore if reliance on global trait cues mediated the relation between age group and detection accuracy (see Figure 2). Specifically, we analysed the total effect (age group predicting detection accuracy), the direct effect (age group predicting detection accuracy when controlling for global trait cues), and the indirect effect (age group predicting detection accuracy *through* global trait cues). A significant indirect effect suggests that age differences significantly predict detection accuracy through global trait cue usage. The Process macro for SPSS was used to test the indirect effect. Unstandardized slope coefficients and bootstrapped confidence intervals are reported. The total effect of age group on detection accuracy was significant, $b = -.475$, $p < .001$, 95% BCa CI [−.656, −.297]. The direct effect of age group on detection accuracy (controlling for global trait cues) remained significant, $b = -.407$, $p < .001$, 95% BCa CI [−.600, −.226]. Although, the indirect effect was also significant, $b = -.068$, 95% BCa CI [−.140, −.018], demonstrating that global trait cues partially mediated the relation between age group and detection accuracy (as the bootstrapped confidence interval does not include zero).

Discussion

The goal of the present study was to examine if age differences in reported cue usage help to explain why older adults are less accurate than younger adults when detecting children's lies. Older adults reported using marginally fewer verbal content and significantly more global trait cues compared to younger adults. The use of global trait cues partially mediated the relation between age group and detection accuracy.

Reported deception cues

The present study found that older adults reported using greater global trait cues compared to younger adults. There are several possible explanations for why older adults more frequently relied on global trait cues compared to younger adults. First, it is possible that lie-detection processes become more holistic with age. Perhaps this is from accumulated life experience with unreliable deception cues whereby older adults no longer rely on specific cues as frequently and instead resort to an overall impression.

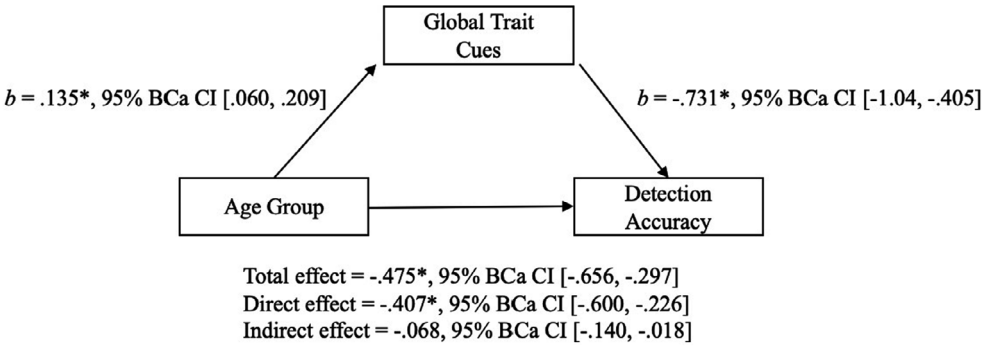

Figure 2. Values for each path represent unstandardized slope coefficients. The indirect effect is estimated by the product of two paths in the indirect effect (.135* −.731). *$p \leq .001$.

Second, it is possible that older adults' greater use of global trait cues is associated with age-related declines in inhibitory mechanisms and attentional control that leave older adults more susceptible to distracting information (Campbell, Hasher, & Thomas, 2010; Hasher et al., 1999; Rowe, Valderrama, Hasher, & Lenartowicz, 2006). Hasher and colleagues (1999) argued that this poorer inhibitory control contributes to working memory retrieval failures that can result in older adults providing more general responses with information that comes to mind quickly and easily (e.g. from schemas). Thus, the greater reporting of global trait cues from older adults may reflect the distracting information that filled one's working memory (via reduced inhibitory control), thereby reducing one's attention to and memory of specific deception cues and producing a more general justification for one's lie-detection judgement (e.g. 'the child just seemed nice'). However, older adults often did report using specific cues in addition to these global traits, indicating that they did not neglect specific deception cues entirely, they merely relied on these more specific cues *less often* than the younger adults. Measuring cognitive performance, such as inhibitory control, working memory, and attentional control, along with a lie-detection measure is an important next step to confirm the potential relations among ageing, cognitive abilities, and detection accuracy.

Beyond differences in cue usage across younger and older adults, it is important to consider other factors, such as age differences in decision-making, as potential explanations for the age difference in detection accuracy. For example, as older adults held a stronger truth bias towards children (O'Connor et al., 2019), this bias to believe children as truthful may impede older adults' abilities to accurately detect their lies. This aligns with research demonstrating a 'positivity effect' in later life where older adults show a cognitive and social preference for positive relative to negative information (e.g. Kensinger & Gutchess, 2017; Mather & Carstensen, 2005). Thus, socio-cognitive changes in later life may bias one to trust children, thereby allowing more lies to be undetected.

Deception cues and detection accuracy

Next, we examined if reported cue usage related to detection accuracy. Prior research has found that both verbal content and verbal auditory cues can differentiate truth- and lie-tellers (Sporer & Schwandt, 2006, 2007; Williams et al., 2014; Zuckerman & Driver, 1985). The present results found that only greater reliance on verbal auditory cues was significantly correlated with superior detection accuracy. As researchers continue to explore children's leakage of deception cues, a future meta-analysis can help to consolidate and confirm the cues that are more or less diagnostic of children's deception. In a novel finding, greater use of global trait cues predicted poorer detection accuracy, and this partially mediated the age decline in detection accuracy. This suggests that relying on an overall impression of one's character may be an (ineffective) lie-detection strategy used more frequently in later life. The present results also complement previous research (e.g. Adams-Price et al., 2004; Anwar et al., 2014; Higgins et al., 2007) by further demonstrating how younger and older adults may indeed differ in perceptions of honest and dishonest testimony and may bring different perspectives to legal proceedings. Given that children may conceal or disclose events such as maltreatment to various adults, including their grandparents, psychologists, social workers, legal professionals, judges, or jurors, who may vary in age, exploring how and why perceptions of the child's report may differ across age groups is important to better understand the process of detecting children's deception.

Limitations and future directions

An avenue for future research can be to assess how cue usage across these assessments may change based on the type of stimuli evaluated (e.g. spontaneous or prosocial lies). In the present study, participants evaluated coached lies. Although examining coached lies is particularly relevant to examine from a legal perspective (as it is important to determine if a child may have been coached by adults on what to disclose), this coaching instruction may change the cues that children leak when questioned (Gongola et al., 2017). Relatedly, although older adults are less accurate at detecting lies across studies (O'Connor et al., 2019; Ruffman et al., 2012; Stanley & Blanchard-Fields, 2008; Sweeney & Ceci, 2014; but see Bond et al., 2005), this remains a small literature with only one study examining detection within the context of children's lies. As such, continued research examining older adults' detection of children's lies is warranted.

Future research would also benefit from including technological methods (e.g. eye-tracking) to compare the cues that participants report using to the cues that participants attend to. As participants self-reported their deception cues, there may be a discrepancy between the cues that participants retrospectively reported compared to the cues actively used. Further, participants were asked to explain two reasons for their lie-detection judgement. Although this was open-ended and participants, on average, provided more than two cues, participants may have felt limited in their ability to provide *all* of the cues that they used. Future research may seek to ask younger and older adults to report all of the cues that they used to detect lies to further explore this possibility. Similarly, by allowing participants to generate their own cues, we captured participants' natural use of various cues, but variability in the types of cues reported differed across categories. Given that participants naturally used fewer verbal auditory and non-verbal cues, we may have been underpowered to detect age differences in these cues. Future studies with larger samples or with designs that ask participants to evaluate the effectiveness of various cues can help to further explore age differences in deception cue usage.

Conclusion

This study demonstrated that younger and older adults show different patterns of cue usage when detecting children's coached lies. Older adults reported using fewer verbal content and greater global trait cues compared to younger adults. Reliance on global trait cues partially mediated the age-related decline in detection accuracy. This information can be used by legal professionals to better understand how and why attitudes towards child witnesses may change with age. Further, these results may be informative for the development of future programmes to improve lie-detection abilities. As cue usage is just one factor that can impact perceptions of children's reports, future research should continue to explore additional mechanisms to better understand how and why perceptions of child witness dishonesty change with age.

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Conflicts of interest

All authors declare no conflict of interest.

Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Appendix 1: A list of the cues reported by participants within each cue category

Verbal content cues	Verbal auditory cues	Non-verbal cues	Global trait cues
Relevance	Response latency	Eye gaze direction	Confident
Accuracy	Response time	Eye contact	Nice
Detail	Speech errors (e.g. stuttering, clarity)	Smiling	Comfortable
Plausibility	Fillers (e.g. um)	Shoulder shrugs	Fearful/shy
Logical structure		Adaptors (e.g. fixing hair, scratching)	Cooperative
Consistency		Body movements (e.g. shifting posture)	Nervous
Sensory information		Gestures	Engaged
Self-corrections		Fidgeting	Motivation to lie
Self-references		Facial expressions	Intelligence
Memory			Age
I don't know responses			Suggestible
Clarification requests			Credible
			Honest