Lyons, M, Healy, N and Bruno, D

It takes one to know one: Relationship between lie detection and psychopathy

Abstract

We investigated primary and secondary psychopathy and the ability to detect high-stakes, real-life emotional lies in an on-line experiment (*N* = 150). Using signal detection analysis, we found that lie detection ability was overall above chance level, there was a tendency towards responding liberally to the test stimuli, and women were more accurate than men Further, sex moderated the relationship between psychopathy and lie detection ability; in men, primary psychopathy had a significant positive correlation with the ability to detect lies, whereas in women there was a significant negative correlation with deception detection. The results are discussed with reference to evolutionary theory and sex differences in processing socio-emotional information.

Introduction

Decades of research in the field of lie detection have argued against the notion that most people are better than chance at identifying liars (e.g., Bond & DePaulo, 2008). However, major disagreement still exists as to whether there are individual differences in lie detection ability and, if so, what individual characteristics may associate with greater accuracy (Bond & Uysal, 2007; O'Sullivan, 2007). For example, Bond and DePaulo (2008) conducted a meta-analysis on several studies, and found that people showed little variation in deception detection accuracy, casting doubt on the existence of lie detection wizards (O'Sullivan & Ekman, 2004). Nevertheless, there may be yet undiscovered individual characteristics that enhance deception detection (Baker, ten Brinke & Porter, 2012). In this respect, an especially relevant domain of individual differences across people is the ability to make decisions and judgments based on the identification and recognition of emotions in others (O'Sullivan, 2005).

Social intelligence (e.g., emotional intelligence and Theory of Mind) relate to increased emotion recognition ability (Mier et al., 2010; Petrides & Furnham, 2003). Individuals with high social intelligence are expected to have enhanced capacity to detect emotional cues in faces, presumably leading to superior lie detection ability (O'Sullivan, 2005). For example, Sylwester et al (2012) found that higher scores on a Theory of Mind measure had an association with enhanced accuracy of detecting co-operators in a Prisoner's Dilemma game. However, social intelligence may also relate to more compassionate reactions to emotional lies, thus hindering the ability to detect emotional deception (Baker, ten Brinke, & Porter, 2012). Rather than improving lie detection, perhaps the ability to perceive emotions in others is related to higher gullibility, or the tendency to rate liars as being truthful. It is possible that individuals who are low in emotional intelligence may be less detracted by *hot* emotional messages, and be more able to concentrate on *cold* cues that will aid in accurate detection (Peace & Sinclair, 2012). One way to measure emotional intelligence is via psychopathy, a trait characterised by low emotional intelligence and empathy (Ali, Amorim, & Chamorro-Premuzic, 2009; Jonason, Lyons, Bethell, & Ross, 2013; Malterer, Glass, & Newman, 2008; Wai, & Tiliopoulos, 2012). Here, we were interested in investigating whether individual differences in psychopathy were associated with differences in the ability to detect deceptive, high-stake emotional lies.

Although psychopathy has been widely researched in relation to lie production (Giammarco et al., 2012; Klaver, Lee, Spidel, & Hart, 2009; Porter, Brinke, Baker, & Wallace, 2011), not many have looked at the role of psychopathic traits in deception detection. The link between psychopathy and higher levels of self-reported lying (Giammarco et al., 2013), as well as lie production and deception detection ability (Wright, Berry, & Bird, 2012), suggests that high psychopathy should be correlated with better lie detection ability. Interestingly, the few studies that have investigated this link have reported null results (Martin & Leach, 2013; Peace & Sinclair, 2012), although methodological limitations may account in part for this; Peace and Sinclair (2012), for instance, used written narratives, which have potentially low ecological validity (O'Sullivan, 2008). Furthermore, previous studies have not made a distinction between the sub-facets of psychopathy (i.e., primary and secondary), which can be quite different in their manifestations and aetiologies (McHoskey, Worzel, & Szyarto, 1998).

The two sub-facets of psychopathy relate to inter-personal and affective deficits (viz., primary psychopathy), and anti-social impulsivity (viz., secondary psychopathy), respectively (McHoskey et al., 1998). Primary psychopaths are more likely to achieve success in the business world, whereas secondary psychopaths are more likely to populate prisons (Gao & Raine, 2010). These sub-facets are also slightly different in terms of emotional processing, primary psychopaths having weaker empathic responses (Seara-Cardoso, Neumann, Roiser, McCrory, & Viding, 2011) and more accurate perception of fearful faces (Del Gaizo & Falkenbach, 2008) than secondary psychopaths. Therefore, we anticipate that primary psychopathy, but not secondary psychopathy, will be associated with better deception detection ability.

It has been suggested that rather than being maladaptive, psychopathy could be a cheater-strategy, a specialisation for exploiting a specific social niche (Bergmüller, Schürch, & Hamilton, 2010; Glenn, Kurzban, & Raine, 2011). The exploitive inter-personal style of primary psychopaths could make them adept in achieving high societal positions (Boddy, 2006), which could be aided by both enhanced lie detection and lie production capacity. Furthermore, psychopathy seems more like a male-typical trait (Cale & Lilienfeld, 2002), facilitating mating-related success in high psychopathy men (Jonason, Li, Webster, & Schmitt, 2009). Interestingly, primary psychopathy is manifested differently between the sexes, for example, via links between low empathy and high psychopathy in men, but not in women (Jonason et al., 2013). Low empathy could be a fitness-increasing adaptation for men, but not necessarily for women, who are high in primary psychopathy. We would expect that if high primary psychopathy is a male-typical adaptation for exploiting others, high psychopathy men would benefit more from enhanced lie detection ability. Secondary psychopathy, in turn, relates to deficits in decision making (Dean et al., 2012), and is less likely to be a heritable trait (Mealey, 1995). Hence, we expect that irrespective of participant sex, secondary psychopathy either relates to impaired lie detection, or has no relationship with lie detection at all.

The present study aims to add to the existing literature by investigating the role of primary and secondary psychopathy in detecting deception in real-life, high-stakes situations. We expect that primary psychopathy, especially in male participants, will be related to enhanced lie detection ability. Furthermore, as age-related decline in both facets of psychopathy has been reported (Gill & Crino, 2012), which could be linked to an age-related decline in competition for status and mates (Wilson & Daly, 1985), we limited our sample to participants who were between 18-30 years of age.

Method

Participants

An on-line experiment, titled "lie detection and personality", was advertised to students at a University in North-West England, who could participate in exchange for a course credit. In addition, the experiment was advertised to the community at large via the first author's social networks, and on psychology research participation websites. After removing participants who were outside of the desired 18-30 age range (n = 50), individuals who indicated that they were familiar with one or more of the cases (n = 48), and outliers (n = 3), the final sample consisted of 150 volunteers (M_{age} = 21.1, *SD* = 3.0; males = 40%).

Materials

We selected 26 real-life high stakes emotional television appeals (13 truthful, 13 lies). These appeals were based on real broadcasts from major television channels in the UK, US, and Australia: in each appeal, a person pleads for information on their loved ones who had gone missing or had been murdered. In half of the cases, the person pleading was later found guilty of murder. In the other half of the cases, someone else was convicted, or the missing person had been found. The appeals were from fathers (2 liars; 3 truthtellers) and mothers (4 liars; 5 truthtellers) appealing for missing children, husbands (4 liars;1 truthteller) and wives (1 liar; 1 truthteller) appealing for a missing spouse, a sister appealing for a brother (1 truthteller), daughters appealing for mothers (2 truthtellers), and strangers appealing for missing children (2 liars). Each video clip had duration between 15-45 seconds.

The 64-item Self-Report Psychopathy Scale-III (Paulhus, Hemphill, & Hare, 2009) was used to assess subclinical primary and secondary psychopathy. Participants rated how much they agreed (1 = *strongly disagree*; 5 = *strongly agree*) with statements such as: "I enjoy driving at high speeds" and "I think I could beat a lie detector." The items were averaged to create indices of secondary (α = .88) and primary (α = .92), psychopathy ($r(150) = .70$, $p < .001$).

Procedure

The first page of the on-line survey contained the participant information sheet and other relevant ethical information. Participants then completed the SRP-III, followed by the video-clips that were presented in randomized order for lies and truths. After viewing each clip, the participants were asked to indicate whether the person was lying or telling the truth. They were also asked whether they were familiar with each case. After completing the survey, participants were thanked, and presented with a full debrief.

Results

To estimate lie detection accuracy we calculated hit and false alarm rates for each individual first and then computed *d′* and *c* from these values as measures of discrimination and bias, respectively, following signal detection theory (Macmillan & Creelman, 2005; Higham, Bruno & Perfect, 2010). The hit rate was calculated as the probability of a liar being correctly identified, whereas the false alarm rate was the probability that a non-liar was identified erroneously as a liar. *d′* and *c* were obtained after applying the Snodgrass and Corwin (1988) correction to the hit and false alarm rates.

Descriptive statistics and sex differences for *d′*, *c*, and primary and secondary psychopathy are reported in Table 1. Females were better than males at discriminating between liars and non-liars (*d′*), but there was no sex difference in bias (*c*). Men also scored significantly higher than women in both primary and secondary psychopathy. Overall, the total sample showed an above-chance ability to tell liars ($t(149) = 16.44$, $p < .001$), and a general tendency towards liberalism ($t(149) = 2.57$, $p = .01$), indicating that participants were biased towards using the "liar" label, irrespective of whether the test item was a lie or a truth.

Consistent with our hypothesis, the moderator analysis on *d'* showed that the sex X primary psychopathy interaction was significant ($\Delta R^2 = .027$, $\beta = -.36$, $t = -3.18$, $p = .002$).The interaction between sex X secondary psychopathy was also significant ($\Delta R^2 = .038$, $\beta = .28$, $t = 2.47$, $p = .02$), but notably went in the opposite direction than the other interaction term. In order to control for shared variance between the psychopathy sub-facets ($r = .65$ for women, and $r = .66$ for men, $p = .001$), we conducted partial correlations separately for sexes for primary psychopathy, *d'* and *c'* (while controlling for secondary psychopathy), and secondary psychopathy, *d'* and *c'* (while controlling for primary psychopathy) (See Table 2 for both partial and zero-order correlations). The Fisher's *Z* indicated that primary psychopathy was associated with more accurate detection deception in men, but not in women. In contrast, we observed the opposite pattern with secondary psychopathy; deception accuracy and secondary psychopathy in men had a non-significant negative trend, and in women, a non-significant positive trend. No variables appeared to be associated with changes in bias, *c*, indicating that psychopathy was not related to the tendency to label truth-tellers as liars.

Discussion

We found that primary psychopathy related to increased lie detection accuracy in men, and decreased accuracy in women, supporting the idea that primary psychopathy is a male-typical adaptation (Jonason et al., 2008), and relates to differential socio-emotional processing depending on the sex of the individual (Jonason et al., 2013). Women had a higher overall accuracy than men had, but there were no sex differences in the bias in labelling participants as liars. Furthermore, participants performed above chance, in line with O'Sullivan, Frank, Hurley and Tiwana (2009), but contrary to findings reported by Vrij and Mann (2001). Finally, we observed a slight liberal bias across all participants in labelling the test stimuli as liars, which was not significantly affected by sex or psychopathy. Overall, our results highlight the importance of investigating deception detection ability differentially in women and men, and within the context of individual differences in personality.

Our results suggest that sex may moderate the relationship between lie detection and psychopathy. In men, primary psychopathy had a positive relationship with lie detection ability, whereas in women, primary psychopathy was associated to lower lie detection scores. This finding supports the idea that primary psychopathy is a male-specific adaptation, linked to competition for mates and social status (Jonason et al., 2009). The high-powered occupations desired by successful primary psychopaths (Boddy, 2006) would certainly benefit from the ability to process deceptive information accurately. Primary psychopathy could be qualitatively different between the sexes (Wynn, Høiseth, & Pettersen, 2012), and has differential effects on empathy depending on the sex of the participant (Jonason et al., 2013). It is possible that men and women use different routes to achieving accuracy in lie detection. Therefore, it would be beneficial to include sex as a moderator in future studies investigating psychopathy and deception detection.

In addition, in women, there was a non-significant positive trend between secondary psychopathy and lie detection accuracy, whereas in men, there was a non-significant negative trend. Although only trends, these findings tentatively suggest that secondary psychopathy, at least for men, is the less successful sub-facet of the psychopathy construct, relating to impaired processing of important social information (Gao & Raine, 2010).A possible explanation for the positive trend in women could be the presence of a link between secondary psychopathy and an overactive threat-detection system in women. Attachment anxiety, which also has an association with hyper-vigilance (Ein-Dor, Mikulincer, Doron, & Shaver, 2010), relates to increased lie detection ability (Ein-Dor & Perry, 2013), as well as to higher scores on a secondary psychopathy measure (Mack, Hackney, & Pyle, 2011). Anxious attachment is more common in women than in men, and has been proposed as an adaptive, female-typical mechanism for detecting threats in the environment (Del Giudice, 2011). Perhaps there are common links between hyper-vigilance, attachment anxiety, and secondary psychopathy, resulting in better lie detection in women, and impaired lie detection in men. These proposed links certainly warrant further investigations in future studies.

The enhanced lie detection ability of women in our sample is intriguing, and contradicts the study of Baker et al (in press), who found that emotional intelligence (typically higher in women, see Schutte et al., 1998) relates to higher gullibility when identifying liars. Women may rely more on intuition when processing subliminal emotional cues (Donges, Kersting, & Suslow, 2012), which could be an asset in deception detection tasks (Albrechtsen, Meissner, & Susa, 2009). Furthermore, research has found that when processing socio-emotional information, women use more often emotional brain areas (such as the amygdala), whereas men are more likely to rely on the activation of cortical areas related to logical processing (Derntl et al., 2010). It is possible that women have an advantage over men in high-stake, emotional lie detection, where accuracy may partially relate to the use of intuition.

We also found that our participants were, overall, more accurate than chance when judging the lies. Our stimulus set comprised of high-stakes emotional lies, which could be easier to detect than non-emotional lies (Warren, Schertler, & Bull, 2009). Research using stimulus from real life situations is in its infancy (Porter and ten Brinke, 2010), and future research should focus on investigating individual differences in personality in judging stimulus where there may be higher emotional leakage in the lies.

In conclusion, we believe that individual differences in lie detection are an important avenue of investigation, and that more research should concentrate on using high-stakes emotional lies, as these might have higher ecological validity than other types of stimulus (see O'Sullivan, 2008, for methodological criticism). Furthermore, it is important to account for sex differences in individual differences in question, as these may relate to lie detection differently depending on the sex of the judge. The callous and unemotional features of primary psychopathy could be of advantage for men in the lie detection context, but have less importance for women. It is likely that the evolutionary pressures behind each sub-facet of psychopathy are quite different for both sexes, and lead to different outcomes in processing of socio-emotional information.

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Table 1. Descriptive statistics and sex differences for the measures

	Mean (*SD*)			*t*-test	Cohen's *d*
	Total	Male	Female		
Primary Psychopathy	82.52 (19.74)	92.42 (19.33)	75.90 (17.16)	5.48**	0.90
Secondary Psychopathy	72.85 (17.50)	79.95 (18.76)	68.11 (14.93)	4.29**	0.70
d'	0.86 (0.64)	0.72 (0.70)	0.95 (0.58)	-2.25*	0.36
c	-0.06 (0.31)	-0.11 (0.32)	-0.04 (0.29)	-1.46	0.23

* $p < .05$, ** $p < .01$

Table 2. Partial and zero-order correlations for d', c' and psychopathy (controlling for secondary/primary psychopathy) (zero-order correlations in parentheses)

	r					
	Secondary Female	Secondary Male	*Z*	Primary Female	Primary Male	*z*
d'	.18 (.02)	-.22 (-.06)	-2.33*	-.24* (-.16)	.26* (.16)	2.93**
c	-.14 (-.08)	.04 (-.05)	-1.04	-.13 (.06)	-.09 (-.10)	0.23

* $p < .05$, ** $p < .01$