Article

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Police, personality and the ability to deceive

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Monica Semrad
Adolescent Risk Research Unit, Sunshine Coast Mind and Neuroscience – Thompson Institute, University of the Sunshine Coast, Australia;
School of Social Sciences, Faculty of Arts, Business and Law, University of the Sunshine Coast, Australia; Australian Federal Police, Australia

Bridie Scott-Parker
Adolescent Risk Research Unit, Sunshine Coast Mind and Neuroscience – Thompson Institute, University of the Sunshine Coast, Australia;
School of Social Sciences, Faculty of Arts, Business and Law, University of the Sunshine Coast, Australia

Abstract
Effectiveness as an undercover operative or human source (informant) handler relies on the believability of police in fictious roles, yet the use of deception by law enforcement in covert fields of policing and criminal interviews remains relatively underexplored in the literature. Moreover, selection processes for these critical police roles do not currently include a test of deception ability. This study investigates the lie production and truth production ability of 50 Australian police officers-in-training by comparing their results on a game of deception with their personality traits as tested by the HEXACO-PI-R-100 item version, the Short-D3 and the MSCEIT. Results indicate that sex, age, dark triad traits and emotional intelligence have no relationship with either truth or lie production. HEXACO results indicate low social self-esteem was related to high lie production ability. Further research is needed to explore extraversion, social skills, and confidence as they relate to the credibility of a 'storyteller'.

Keywords
Lie production, police, law enforcement, selection tests, personality traits, individual differences, lying, undercover

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Introduction

Since time immemorial there has been rivalry between police and criminals. Whereas those 'fighting the good fight' have limitations imposed by legislation and human integrity, the criminal element has no such restrictions. Historically, our system of justice has attempted to even the playing field by training members of the judicial system to detect deception and uncover the truth. Unfortunately, decades of studies conducted all around the world, including experiments with participants comprising police, judges and psychologists, show accurate lie detection to be little better than chance (DePaulo, 1994; DePaulo et al., 2003; Ekman and O'Sullivan, 1991; Porter et al., 2000). Moreover, a meta-analysis of the extant literature (Bond and DePaulo, 2008) has demonstrated that lie detection is not possible through behavioural indicators alone (Burgoon and Buller, 1996; Volbert and Banse, 2014; Vrij, 2014). Thus, unsurprisingly, lie detection tests are not used in the Australian justice system (Freckelton, 2004; McMahon, 2003).

Fortunately, however, the inability to distinguish lies from truth is common to all; offenders have as much

Corresponding author:
Monica Semrad, University of the Sunshine Coast, 12 Innovation Parkway, Birtinya, Queensland, 4575, Australia.
Email: M_S329@student.usc.edu.au

difficulty detecting lies as do those working in the justice system. Therefore police, whether general duties, undercover operatives (UCOs) or dealing with informants (human sources; HSs), can and do use deception (Craig, 2003) as a tool to uncover general and specific details of crimes and provide obtained evidence to courts (R v Swaffield, 1998; Pavic v R, 1998). Importantly, there are also additional risks for law enforcement; there are risks to the operation, and risks to the personal safety of the police officers, if the lies are uncovered by the criminal (Marx, 1988). Despite the widespread use and possible consequences of deception by police forces (Craig, 2003), the ability to tell a convincing story or lie, termed lie production, has received little research attention (Vrij et al., 2010; Wright et al., 2012). One important finding, however, is the statistically significant difference in the individual variance in the ability to successfully tell a lie (Kraut, 1980), which is not replicated in the ability to detect lies (Bond and DePaulo, 2008). This finding suggests a stable, testable lie production skill, that may not be found in all people. Once the underlying components of this skill are identified, selection testing for police seeking deployment in these covert fields could be developed and applied.

Selection processes

Selection processes usually consist of a number of tests (e.g. written application, attitude, specific skills testing and interviews) and are best when based on a job description (Aamodt, 2007). Selection processes are conducted by most organizations for a variety of reasons; for example, the process provides both the organization and the candidate with an understanding of fit, the expectations of the role, and alignment with and the skills of the candidate. For the organization, a selection process provides transparency (thereby reducing allegations of nepotism), litigation protection if the process is challenged, with courts in the USA more likely to support the organization if an evidence-based process is employed for selection (Kaczmarek and Packer, 1997), cost effectiveness (by reducing the amount of training and/or retraining required), and employee satisfaction, which is known to increase productivity (Aamodt, 2007; Cochrane et al., 2016; Shum et al., 2006). In addition, for sensitive areas such as covert roles of UCO or HS, appropriate selection processes should identify people who will be effective in the role to ensure safety for the undercover officer, other police and civilians, thus enhancing operational, and therefore organizational, success. Selection processes conducted prior to training in these specialist areas also reduces exposure of covert methodology, covert technology and identification of other covert assets (e.g. officers, vehicles and premises). The high financial cost, time and risk of training members in covert capabilities is only compounded when, at the end of the training, these members are unofficially labelled 'not believable' in the role and therefore never deployed. Worse still, is the risk to the person and the organization if they are deployed due to budgetary restraints and/or staff shortages and are not accepted in the role. Furthermore, exposure as a police officer can damage and/or destroy the investigation. The flow-on effect for the organization in terms of community and government trust has long-term ramification for the organization's financial and reputational future.

Although errors made through inappropriate or insufficient testing of covert operatives are usually kept in-house, there are academic papers (Marx, 1982; Tinto, 2012) and several recent media examples from around the world of criticism where police operations involving UCOs have not aligned with public expectation. For example, in Lancaster County, USA, undercover detectives were reported to have engaged in sex acts prior to making arrests for solicitation (Blest and Meko, 2019). The report notes that the link between prostitution and sex trafficking should be investigated, recognizing that the sex-workers (often with limited English skills) were exploited by the police officers. Importantly, Superior Courts in the USA have dismissed similar cases for 'outrageous government conduct' (Editorial, 2019), which impacts not only the officers and the police force, but the reputation of policing in general, with officers involved commonly reported to have received additional training (Blest and Meko, 2019), rather than deployment in other non-covert roles. Relatedly, concerns regarding undercover policing in the UK have led to a public inquiry, with 43 ex-officers from Scotland Yard expected to give evidence in due course (Police Oracle, 16 July 2019). The second module of the inquiry, anticipated to be conducted in 2020, will examine 'the management and oversight of undercover officers, including their selection, training, supervision and care after the end of an undercover deployment.' (Mitting, 2019). The results of the inquiry will no doubt have an impact on undercover policing around the world. Thus, research regarding selecting appropriate police officers for covert policing is timely on the global law enforcement stage.

Definition of lying

Lying is the withholding or transfer of information, with or without words, which attempts to provide another with an understanding or belief that the liar knows to be untrue (Vrij, 2002; Zuckerman et al., 1981). A successful lie is one in which the receiver accepts the information, unaware that it is false. A number of lie-relevant theories and tests have been applied within this realm, including dark triad (DT), emotional intelligence (EI), impression formation theory (IFT) and HEXACO.

Theories regarding deception

Early deception theories suggested that good liars had reduced, or were devoid of, feelings of guilt or fear, and therefore did not provide any reliable behavioural indicators of deception (Ekman and Friesen, 1969; George et al., 2014). This finding led to deception testing of people who exhibited personality traits associated with low guilt or low fear such as those found within the DT.

The dark triad

The DT is a personality trait cluster (Machiavellianism, narcissism and psychopathy) (Paulhus and Williams, 2002) associated with lack of responsibility for actions or consequences (Wissing and Reinhard, 2017). Notwithstanding the apparent relationship with lying and deception, studies examining DT traits with active deception have produced mixed results (Semrad et al., 2019). To illustrate, Machiavellianism is defined as being manipulative, callous and cynical (Christie et al., 1970; Jones and Paulhus, 2014); although earlier studies have revealed that people high in Machiavellian traits were more successful at lying and were seen as more credible than people low in Machiavellian traits (Exline et al., 1970; Geis and Moon, 1981), the results were not replicated in subsequent studies (Christie et al., 1970; Manstead et al., 1986; Zuckerman et al., 1981). Narcissism is associated with superiority, entitlement and excessive self-love (Jones and Paulhus, 2014), and has been positively correlated with confidence in lying ability (Giammarco et al., 2013). This relationship suggests that people with narcissist personalities believe they lie easily and more convincingly. Yet, studies testing the believability of lies told by narcissist's ability are few, and to the author's knowledge, only one paper has reported that narcissists are better liars. Psychopathy is characterized by impulsivity and low empathy (Hare et al., 1989). Although a 'greater ability to lie successfully' was self-reported among people high in psychopathy, there is no evidence to suggest that this is actually the case (Hare et al., 1989; Klaver et al., 2007; Peace and Sinclair, 2012).

DT traits have been found to be significantly related to each other (Jakobwitz and Egan, 2006; Lee and Ashton, 2005; Paulhus and Williams, 2002), and significantly related to personality traits captured in the Five-Factor model (Costa and McCrae, 1992) (low Agreeableness; Paulhus and Williams, 2002), and the HEXACO model (low Honesty–Humility; Lee and Ashton, 2005). Although deception theories have progressed away from behavioural indicators only, research findings continue to be of interest due to the association between DT traits and deception credibility. Additionally, evolving theories in the realm of deception focus on good acting ability and perceptiveness regarding the receiver's acceptance of the story. This has promulgated research focused on elucidating the traits which underlie social skills, including awareness and control of emotional communication, which is the basic premise for EI.

Emotional intelligence

EI was originally defined as 'a subset of social intelligence that involves the ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide one's thinking and actions' (Salovey and Mayer, 1990, p. 189). Other definitions include the skill of manipulation; the ability to make people do things regardless of their own desires (Ashkanasy and Tse, 2000; Goleman, 1995). EI is most often tested through the abilities to perceive, control, understand and manage emotions of the self and of others, and the interactions between each of the skills to enhance another skill (Mayer, Roberts and Barsade, 2008; Mayer, Salovey and Caruso, 2008). People with high EI require less cognitive effort to solve emotional problems, and typically are drawn to occupations involving social interactions. In general terms, EI is a valuable trait or ability where understanding and control of emotions contributes to success (Mayer et al., 2004). Because the ability to deceive involves a complex type of social performance, it follows that individual differences in social skills would be closely linked to deception ability (Riggio et al., 1987). Social skills are also likely to impact on likeability, believability, credibility and general impression (Riggio and Friedman, 1986; Riggio et al., 1988).

Research comparing EI with lie production ability has produced disparate results, most likely due to the variation in study designs and measures used (Levine, 2018; Semrad et al., 2019). Although a statistically significant negative relationship has been found between lie production ability and EI (Baker et al., 2013), others have found no relationship at all (Wright et al., 2012), suggesting further exploration is required. Interestingly, although both greater DT traits and greater EI were theorized to relate to effective lie production ability, research shows that both psychopathy and Machiavellianism are negatively correlated with EI (Austin et al., 2007; Lyons et al., 2013). These results, in addition to research findings that successful lies are not based on the lie detection abilities of the receiver or behavioural indicators of the storyteller, but on the credibility and believability of the storyteller (Bond and DePaulo, 2008; Semrad et al., 2019), have redirected research to a focus on the impression that the storyteller makes on the receiver.

Impression formation theory

IFT explains findings that some people are simply believed more often than others through the process of developing

an impression of a person, based on their traits, from descriptions, and implied by behaviour, and how similar those traits are to the judge (Wyer et al., 1995). Where the storyteller is not known to the recipient, it follows that greater emphasis is placed on information (behaviour) and assumptions or biases. Research examining impressions and credibility has found that some people simply appear more truthful than others regardless of the story told (Bond and DePaulo, 2008), with 'good liars' higher in social skills, extraversion, expression and communication, and socially confident (Anolli and Ciceri, 1997; Riggio and Friedman, 1983; Riggio et al., 1987). Similarly, extraversion and expressiveness have been found to be high in people judged as likeable speakers (Riggio and Friedman 1986), which also highlights the social nature of interpersonal communications including deception. For example, credibility has been found to be rated more highly than honesty, so much so that liars with high credibility are more likely to be believed than truth-tellers with low credibility (Bond and DePaulo, 2008). Despite these findings, the individual differences (vis-à-vis personality traits) that underlie successful lie/truth production and credibility are largely unknown. Identification of these traits could provide vital information for creation of selection tests for police seeking to work as undercover officers, of whose safety relies on their ability to lie convincingly (Vrij et al., 2010).

HEXACO

A more direct method of identifying the underlying traits associated with successful lie production would be to compare lie production ability with a broad measure of personality that encapsulates a breadth of traits. The current dominant personality theories are the Five-Factor model (Costa and McCrae, 1992) and the HEXACO model (Ashton et al., 2000; Wissing and Reinhard, 2017); the difference between the theories being the additional personality domain of Honesty–Humility in the HEXACO. This domain is believed to capture the traits of sincerity, fairness, greed-avoidance and modesty, all of which seemingly would be associated with both deception and credibility (domains are capitalized in this paper, to differentiate from traits). Although no research to date has compared HEXACO results with lie production ability (Semrad et al., 2019), research focusing on the personality traits of people who are more successful storytellers – comprising truth or lies – reveals that people high in expressiveness and social tact are more successful at lying than people who display social anxiety (Riggio et al., 1987). Tests which could select certain personality traits and exclude others would be valuable when selecting lie producers, such as effective law enforcement officers (Baker et al., 2013).

Participant types

A recent literature review of lie production research (Semrad et al., 2019) found that all of the extant research conducted had been undertaken on members of the general public. These participants represent a broad group of personality types. In comparison, the selection process for UCOs and HS handlers is predominantly available only through policing or other government agencies, making the applicant pool significantly smaller, and arguably less generalized and more specialized in terms of personality types. Although there are no definitive personality profiles for police officers, more than 90% of police forces in the USA now require a psychological evaluation (Cochrane et al., 2016). Given the relatively unique authority police officers have to invade privacy and to use force on others, certain individual preferences are clearly evident (Cochrane et al., 2016). To illustrate, traits based on the job description include greater social capabilities, reliability, resilience and communication skills, and a lack of violent or additive behaviour (Cochrane et al., 2016). For the purpose of experimentation, studies comprising only police officers, considerably skew the participant group regarding personality trait characteristics. Also, although police forces world-wide are aspiring to be more representative of the community they serve, the majority still employ more men, and more non-culturally different people, than the communities in which they work. Not only does this limit the participant pool from which UCOs and HS handlers are drawn, it also creates a unique subset of personality types in the potential and actual selection group.

A final consideration is that previous studies examining deception have often been subject to one or more criticisms in relation to the method in which the experiment is conducted (Wright et al., 2013). Those concerns, such as conducting deception testing via video-recorded lies and providing participants with limited motivation to lie, which are detailed in a literature review focusing on deception production research (Semrad et al., 2019), have been addressed in this study through the experiment design. For example, conducting deception face-to-face, where all aspects of communication, from facial expression, to body language and voice tone, are included in the interaction.

This study replicates previous research which focused on identification of the personality traits and abilities of effective storytellers (truth and lies) with a sample of police officer recruits in this case. Based on the literature review (Semrad et al., 2019) and previous experiments using similar testing (Wright et al., 2013, 2015) it is hypothesized that, for police, no relationship will be found between age, sex or the DT traits, and truth or lie production ability; nor will there be any relationship found between EI and truth or lie production ability. It is further hypothesized that the

HEXACO traits within Extraversion will be positively associated lie production.

Method

Participants

Australian Federal Police recruits ($n = 50$; 31 men) provided informed consent to participate in the study. Of the 45 participants who provided their age, the range was 21 to 46 years ($M = 30.24$, $SD = 6.80$). Four participants had previous experience working as police officers.

Measures

The D3-Short. The (D3-Short, SD3) (Paulhus and Williams, 2002) was used to test the DT, across the three subscales of Machiavellianism (e.g. 'Most people can be manipulated'), narcissism ('I have been compared to famous people') and psychopathy ('I like to pick on losers'). The 27-items are measured via a 5-point Likert scale (1 = Disagree Strongly, 5 = Agree Strongly). After recoding the reverse-scored items, subscale scores were created by averaging scores across each subscale. Reliability for the subscales were Machiavellianism ($\alpha = .71$), psychopathy ($\alpha = .67$) and narcissism ($\alpha = .61$). Subscale intercorrelations were: Machiavellian with psychopathy .37 at $p < .01$; Machiavellian with narcissism .32 at $p < .05$ level; psychopathy with narcissism .21 (non-significant); both sets of results are similar to previous findings (Jones and Paulhus, 2014).

MSCEIT. The Mayer–Salovey–Caruso Emotional Intelligence Test (MSCEIT v.2.0) (Mayer et al., 2002) was used to measure EI. Scores for the MSCEIT, which is tested not self-assessed, can be interpreted at three levels; total scale (one score of general EI), area (two area scores – experiencing and strategic EI) and branch levels (four branch scores for perceiving emotion accurately, using emotion to facilitate thought, understanding emotion and managing emotion) (Mayer et al., 2003). Reliability for the MSCEIT at total, area and branch levels, was calculated using split-half reliability coefficients (due to heterogeneity) which for the current study were: .95 (total scale), area levels .94 (Experiential) and .87 (Strategic), and branch levels .95 (perceiving), .78 (facilitating), .72 (understanding) and .81 (managing). Cronbach's alpha values for MSCEIT subscales ranged from .47 (Blends) to .91 (Pictures) and are reported in Appendix A.

HEXACO. The HEXACO-PI-R-100 item (Lee and Ashton, 2004) is based on the HEXACO model of personality which proposes six factors: Honesty–Humility (H), Emotionality (E), Extraversion (X), Agreeableness (A), Conscientiousness (C) and Openness to Experience (O) (Ashton and Lee, 2007). Divided in half, some factors (H, E and A) represent traits related to unselfish tendencies, while the remainder (E, C and O) represent traits related to social, work, and idea-related engagement (Lee and Ashton, 2016). Cronbach's alphas for the HEXACO factors were: H ($\alpha = .79$), E ($\alpha = .81$), X ($\alpha = .89$), A ($\alpha = .81$), C ($\alpha = .80$) and O ($\alpha = .82$). Trait reliabilities ranged from .31 (perfectionism) to .84 (liveliness) and are reported in Appendix A.

Game of DeceIT. The Deceptive Interactive Task (DeceIT; Wright et al., 2012) is a test of deception ability that commences after completion of an opinion survey developed by the first author. The survey seeks the true opinions of participants on 12 socially contentious topics (e.g. 'Circumcision is child abuse') and serves as a baseline of true opinion. The DeceIT commences with one participant drawing a card from their individual pile of ten cards (five truth; five lie – instruction; random in order and topic). The participant (storyteller) then speaks (either the truth or a lie, depending on the card instruction) for approximately 20 seconds, attempting to convince the other participants that their story reflects their true opinion. Participants who are not speaking play the role of lie detector. After each 20-second story, all participants judge the story (truth/lie) before the next participant takes a card and speaks (thus completing one game). The game continues until each participant completes ten trials as the storyteller. Because truth/lie cards were selected randomly; some participants were required to speak both a lie and the truth on the same topic(s) during the course of their trials. This reduced the number of different topics used and meant reliability could not be calculated by traditional means. As no method of calculating reliability for DeceIT had been published at the time of preparing this article, an alternative form of reliability was calculated for the proportion of games the question was successful in deception. Results indicate that the least successful question was Question 2 (Marriage should be available to all, not just heterosexual people – 20.3%), followed closely by questions 4 (Abortion should be legal and accessible – 20.2%), and 5 (People should be allowed to choose when they die – 21.0%). Question effectiveness is reported in Appendix B for this study, in addition to the question effectiveness of the previous study using university students.

Procedure

The study was approved (Protocol number 2014/743) by the University of Sydney Human Research Ethics Committee. Approval was also obtained from the Learning and Development Portfolio of the Australian Federal Police.

Approximately 60 police recruits across two classes were invited to participate via a short presentation that described the aim of the study, the personality tests and the Game of DeceIT. The relevance of these skills to police officer duties was highlighted. Volunteers provided their details including email addresses, which served as on-line access to the first of two parts of the study.

- Part 1 – The survey was available online via SONA (University of Sydney experimental management system). The completion time ranged from 10 to 40 minutes with the majority (76.7%) of participants completing the demographics, HEXACO and Short D3 within 20 minutes. The average time taken to complete the MSCEIT was 41 minutes.
- Part 2 – The Game of DeceIT was conducted in police college tutorial rooms where participants were seated at tables facing each other. On completion of the opinion survey, each participant received ten cards face-down, a score card and a pen. The game was explained and participants were advised that the ability to detect the truth is as important as the ability to detect a lie, to mitigate against response bias. The activity finished once each participant completed ten rounds as the storyteller. Each game was video-recorded. Depending on group size ($n = 4$ to 9), each game took between 35 and 60 minutes.

Owing to a power-failure during one of the experiments, participants could not complete the MSCEIT (previously a requirement for DeceIT participation). The participants affected ($n = 8$) participated in the game of DeceIT without having completed the MSCEIT, with most ($n = 5$) completing the MSCEIT when power was restored.

Data collection and analysis

Based on the four possible outcomes, each participant was given a score for the number of times their:

- lie was scored by others in the group as a lie (lie told; lie scored);
- lie was scored by others in the group as the truth (lie told; truth scored);
- truth was scored by others in the group as a lie (truth told, lie scored);
- truth was scored by others in the group as a truth (truth told; truth scored).

Participant error (e.g. telling the truth when the card instructed 'lie'), although rare, was most commonly identified by the participant and scored according to true beliefs rather than the card instruction. All scores were verified to ensure correctness using score cards and video recordings.

Signal detection theory

In the game of DeceIT, to differentiate between the truth (presence of a signal) and a lie (absence of a signal), signal detection theory (SDT; Green and Swets, 1966) was used as it is appropriate for situations in which distinguishing between two options is less than clear. SDT analysis provides information on discrimination accuracy which is based on the signal provided and how well it is perceived/read (i.e. determining a truth from a lie) (sensitivity – d') and individual preconceived biases or 'tendency to favour one response over the other' (Macmillan and Creelman, 1990, p. 401) (response bias – c) (Fisher, 2014; Meissner and Kassin, 2002). It is important to note that c and d' are independent measures (Stanislaw and Todorov, 1999). Mathematical calculations of d' range between 0, which indicates the inability to distinguish lies from truth (Stanislaw and Todorov, 1999), and > 4 where differentiation between a lie and the truth is most accurate (Sorkin, 1999). Simply put, SDT is able to determine if participants are likely to be distinguishing lying from the truth or truth from lying, or if participants are biased and simply responding with one answer to the majority of trials which may increase their lie detection scores (Fisher, 2014).

Results

Descriptive statistics

Table 1 summarizes participants descriptive statistics for DT, HEXACO and MSCEIT scores. As can be seen, within the HEXACO scores, the highest mean scores are for fairness, social self-esteem and diligence (note that three males did not complete the MSCEIT).

SDT analysis

Per SDT, a truth told, scored as truth (Hit) determined successful truth production, whereas a lie told, scored as truth (False Alarm) determined successful lie production. As two participants (storytellers) received full scores (100%; the upper limit of 0/1 scores) for either Hit or False Alarm rates, z scores calculations are infinite, making further calculation difficult. Therefore, the log-linear method (Hautus, 1995) was applied to all the data. There was no significant difference in truth production ability between males ($M = .72$, $SD = .12$) and females ($M = .69$, $SD = .08$) ($t(49) = .99$, $p = .325$, $d = 2.68$). There was no significant difference in lie production ability between males ($M = .40$, $SD = .16$) and females ($M = .37$, $SD = .14$) ($t(49) = .64$, $p = .528$, $d = 1.25$). There were

Table 1. Mean, standard deviation, and range for the dark triad and HEXACO sub/scales.

	N	Mean	SD	Minimum	Maximum
Dark triad					
Machiavellianism	50	3.21	0.51	2.22	4.44
narcissism	50	2.59	0.45	1.56	3.56
psychopathy	50	2.03	0.45	1.11	3.00
HEXACO					
sincerity	50	3.42	0.77	1.25	5.00
fairness	50	4.33	0.62	2.25	5.00
greed avoidance	50	3.46	0.79	2.00	5.00
modesty	50	3.94	0.58	2.75	5.00
Honesty Humility	50	3.79	0.46	2.88	4.69
fearfulness	50	2.12	0.61	1.00	3.50
anxiety	50	2.85	0.69	1.50	4.50
dependence	50	2.69	0.74	1.25	4.00
sentimentality	50	2.97	0.83	1.00	4.25
Emotionality	50	2.66	0.49	1.31	3.56
social self esteem	50	4.01	0.57	2.50	5.00
social boldness	50	3.25	0.79	1.50	5.00
sociability	50	3.46	0.82	1.50	5.00
liveliness	50	3.73	0.77	2.00	5.00
Extraversion	50	3.61	0.57	2.50	4.94
forgiveness	50	2.56	0.64	1.25	3.75
gentleness	50	3.24	0.74	1.50	5.00
flexibility	50	2.95	0.59	1.75	4.00
patience	50	3.48	0.64	2.00	5.00
Agreeableness	50	3.06	0.44	2.00	4.06
organization	50	3.76	0.74	2.00	5.00
diligence	50	4.11	0.56	2.50	5.00
perfectionism	50	3.55	0.51	2.25	5.00
prudence	50	3.60	0.57	2.00	5.00
Conscientiousness	50	3.75	0.43	2.81	4.88
aesthetic app	50	2.72	0.84	1.00	5.00
inquisitiveness	50	3.74	0.81	1.75	5.00
creativity	50	3.09	0.84	1.50	5.00
unconventionality	50	3.19	0.66	2.00	4.75
Open to Experience	50	3.18	0.57	1.88	4.69
altruism	50	3.76	0.61	2.25	5.00
MSCEIT					
Perceiving	47	96.20	16.31	62.00	132.28
Using	47	93.87	13.86	51.93	116.61
Experimental	47	93.73	17.10	36.58	123.54
Understanding	47	98.17	10.08	53.47	114.94
Managing	47	95.19	9.21	63.56	109.15
Reason/Strategic	47	96.32	10.38	43.62	113.66
TOTAL	47	94.86	14.12	39.40	117.70

no significant correlations between age and truth production ability, or age and lie production ability (Table 2).

Story production analysis

The average rate at which a story (truth or lie) was believed was 55.0% ($SD = 21.8\%$). Consistent with truth bias and the veracity effect, comparison of production rates showed a significantly higher mean accuracy for truth production ($M = 71.9\%$, $SD = 11.0\%$) than lie production ($M = 38.0\%$, $SD = 16.0\%$) ($t(49) = 11.10$, $p < .001$, $d = 2.51$).

Table 2. Correlations between demographics, dark triad and MSCEIT measures, and truth and lie production.

	N	Truth production	Lie production	d'	c
Demographics					
Sex	50	−.142	−.091	−.021	.200
Age	50	−.152	−.062	−.039	.167
Dark triad					
Machiavellianism	50	.049	−.077	.064	.038
narcissism	50	−.095	−.099	.018	.175
psychopathy	50	−.032	−.063	.02	.075
MSCEIT					
Perceiving	47	.155	−.275	.291*	.168
Using	47	.163	−.158	.212	.077
Experimental	47	.206	−.215	.274	.090
Understanding	47	.210	.056	.087	−.194
Managing	47	−.038	−.019	−.027	.085
Reason/ Strategic	47	.101	.015	.037	−.055
Total EI	47	.177	−.153	.208	.056

Note: * p < .05

Dark triad

As hypothesized, no significant relationships were found between any of the DT measures and either truth or lie production (Table 2).

Emotional intelligence

All scoring for the MSCEIT was via general scoring (i.e. the consensus of laypeople) as opposed to expert scoring (consensus of experts), as the ultimate aim of this research is deception as judged by laypersons engaged with police officers. As hypothesized, no significant relationships were found between any of the MSCEIT measures and either truth or lie production. An association was found between perceiving and d' ($r(47) = .291$, $p < .05$) (Table 2), such that increased ability to perceive emotions was related to increased signal strength (i.e. detection of a clear difference between lie and truth production).

HEXACO

Truth production. Contrary to the hypothesis, truth production was not significantly related to traits within the Extraversion domain of the HEXACO (Table 3).

Table 3. Correlations between truth production, lie production ability and HEXACO measures.

	Truth production	Lie production	d'	c
sincerity	.087	−.043	.078	−.029
fairness	.080	−.198	.199	.134
greed avoidance	−.128	−.031	−.065	.141
modesty	.262	−.177	.256	−.007
Honesty Humility	.091	−.154	.152	.091
fearfulness	−.117	.122	−.120	−.058
anxiety	−.188	.076	−.154	.064
dependence	.090	−.006	.079	−.068
sentimentality	−.212	−.242	.029	.361**
Emotionality	−.159	−.040	−.049	.132
social self esteem	.124	−.343	.293*	.252
social boldness	−.083	−.094	.019	.172
sociability	.014	−.099	.077	.124
liveliness	.118	−.275	.257	.205
Extraversion	.046	−.244	.192	.235
forgiveness	.049	.077	−.032	−.085
gentleness	.218	−.019	.134	−.109
flexibility	−.173	.092	−.165	.021
patience	−.087	.105	−.114	−.029
Agreeableness	.021	.090	−.052	−.081
organization	.014	−.030	.031	.045
diligence	−.091	−.243	.109	.311*
perfectionism	−.075	−.084	−.004	.166
prudence	−.026	−.068	.034	.095
Conscientiousness	−.054	−.139	.059	.201
aesthetic app	−.119	.236	−.231	−.142
inquisitiveness	.081	.025	.020	−.088
creativity	.018	−.011	.030	−.003
unconventionality	−.074	.127	−.109	−.066
Open to Experience	−.030	.128	−.098	−.103
altruism	.189	−.112	.169	.019

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

Lie production. Contrary to the hypothesis, lie production was significantly negatively correlated with social self-esteem ($r(50) = -.343$, $p = .015$), a trait within the Extraversion domain, suggesting that high social self-esteem is related to low lie production ability. Approaching statistical significance and related to lie production was liveliness ($r(50) = -.28$, $p = .053$), which falls with the Extraversion domain of the HEXACO. The negative correlation suggests that high scores in these traits may be indicative of low lie production ability. A significant positive correlation between d' (sensitivity measure) and social self-esteem (from the domain of Extraversion) ($r(50) = .293, p = .039$) was found, suggesting clearer signal strength to be associated with high self-esteem, while bias (c) was related to sentimentality (Emotionality) ($r(50) = .36$, $p < .01$) and diligence (Conscientiousness) ($r(50) = .293$, $p < .05$), suggesting high scores in the traits relates to high response bias.

Lie production and lie detection. The availability of lie detection data in addition to truth/lie production data from the game of DeceIT (Wright et al., 2012) allowed for comparison of each participant 'lie detector' score with their 'lie producer' score (i.e. False Alarm in lie production with Hit in lie detection data). No correlation was found between lie production and lie detection, there was, however, a significant positive relationship between truth production and lie detection ability (i.e. people judged as truthful when telling a truthful story were also better at lie detection than the remainder of the group).

Discussion

This research sought to identify the personality traits of police officers who are good at storytelling (truth or lie production) to create a selection process within policing for members seeking entry into covert areas. As predicted, neither sex nor age were associated with successful truth or lie production, which is consistent with previous research (Wright et al., 2015). Overall scoring indicated a large effect for truth bias and the veracity effect, which is also consistent with previous research (Levine, 2018; Levine et al., 1999; Zuckerman et al., 1981). We note also the effect was likely increased by researcher instructions that 'truth detection was as important as lie detection' when participants were in the role of lie detector (Semrad et al., 2019). As hypothesized, none of the DT traits (Machiavellianism, narcissism or psychopathy) were associated with either truth or lie production, which is consistent with previous research (Wright et al., 2015). Thus, the results imply that deception ability is not associated with these negative traits. Similarly, the lack of a statistically significant relationship between EI and truth/lie production was expected, and is also in line with previous research using alternate EI measures (Wright et al., 2012). The association between signal strength and the perceiving emotions element of EI suggests that people high in the ability to perceive emotions were clearer and more distinct between their telling of lies and truth.

Contrary to comparative research with 84 university students, no relationship was found between truth production and any of the HEXACO traits. In terms of lie production, the significant but unexpected negative relationship with a trait within the Extraversion domain (social self-esteem) is in stark contrast to previous research that found a trait within Extraversion (social boldness) was indicative of successful lying (details of differences in traits underlying good liars for university students and AFP recruits in Appendix C). This outcome may be indicative of the different participant groups (AFP recruits being known to each other, while the university group were, by and large, strangers), and/or the difference in the two traits within

Extraversion which are identifying different aspects of the traits. Thus, the results warrant further testing and exploration. The differences in groups, based on age, life-experiences and focuses for each group is also the likely reason for the differences in question effectiveness (Appendix B). Whilst reducing the number of questions to those more effective would increase reliability, the repetitive nature of the game was assisted by different and random topics (see also Appendix B).

Distinguishing between a lie and the truth (sensitivity) was positively associated with social self-esteem, suggesting clarity of signal by a person who is more animated in style in truth/lie production. Bias was related to sentimentality and diligence, such that people high in these traits were more likely to receive truth scores to either their truth or their lie told. The lack of relationship between lie production and lie detection is in line with the majority of previous research (DePaulo and Rosenthal, 1979; Levine, 2016; Manstead et al., 1986; Semrad et al., 2019) and supports previous suggestions that different personal and personality skills are involved (Manstead et al., 1986).

Broadly, results suggest that truth and lie ability, rather than a negative trait synonymous with manipulation and self-promotion as found in the DT, may be underpinned by more general (and positive) personality traits. Although these results appear to differ to those of previous research (i.e. university students), the differences only relate to the HEXACO, and are similar with both studies identifying links to Extraversion traits. The difference in results may be based on the participants in each study. University students applying to be part of a deception study may be more confident and/or narcissist than their colleagues, and people higher in narcissism may appear more confident and therefore more believable. Notably the subset of general population who are police officers also may have similar personality traits, requiring more intricate trait investigation. Also, the police officers were known to each other and may have already discussed some of the study topics, therefore they may already know each other's true opinions, making deception either as truth-teller or liar, more difficult.

Limitations of the study

Deception in laboratories has a number of limitations, including placing participants on notice to watch for trickery (Levine, 2018; Sip et al., 2010), and the requirement for instant judgement without time to reflect on the story (Levine, 2018; Semrad et al., 2019) and without the benefit of other information which might be present in a natural setting (Levine, 2018; Park et al., 2002). As the people engaged by UCOs are suspected of criminal activity (either directly, or by extension), these individuals may be more suspicious of, and during, interactions, therefore being on notice for deception may actually be an effective method of testing for application in a real situation. Further, regardless of the motivation provided for participants, it is unlikely to come close to the motivation experienced by police in UCO roles as lie producers, and experienced by suspects as lie detectors. Therefore, although there is some evidence to suggest that motivation does not have a great impact on deception testing (Bond and DePaulo, 2006), fundamentally testing will be different to real-world application.

Implications of findings

The practical implications for policing comprise the inclusion of the HEXACO personality test within the battery of selection tests already being conducted prior to selection. The HEXACO will provide insight into the applicant's personality traits. The traits identified should be compared with the personality traits classified as most indicative of a 'believable or credible' person (Semrad and Scott-Parker, 2019) (e.g. high extraversion, high sentimentality and high diligence).

Implications for management are that the HEXACO, which may already be in use by psychologists to test undercover applicants, or may produce similar results to those sought by the NEO PI-R (Costa and McCrae, 1992) or other broad personality measures, would be inexpensive and/or cost neutral (time and money) and would serve a dual (possibly multiple) purpose(s) of identifying personality traits for a number of selection filters. There is no suggestion that the HEXACO alone would identify the ideal personality trait of a covert operative, nor is 'believability' the only selection criterion for determining an effective operative. However, 'believability' should be considered as part of a robust and balanced selection process to ensure officers selected are effective and therefore beneficial to the organization and to operations and investigations.

Operational requirements such as language skills, sex, and/or additional skills and abilities (e.g. pilot's licence) may result in consideration of applicants who are rated as only 'average' on the believability measures. For leaders, knowledge of lower believability ratings allows for increased operational planning, risk mitigation strategies, and/or greater backstopping to ensure officer and operational security and safety.

Future directions

To date, testing with the game of DeceIT has been conducted with lie producers and lie detectors being the same participants. Future testing should conduct testing between police as the lie producers, and a broader population base as lie detectors, to replicate more realistic situations. Such a methodology would also ensure that the lie detectors have

limited information regarding the game (vis-à-vis the number of lies/truths). In terms of personality and ability testing, more in depth testing of the HEXACO would be illuminating, especially greater detail regarding the traits of sentimentality and diligence, and social self-esteem (a subscale of Extraversion), which should be conducted via multiple methodologies. There appears to be little value in further testing in the realms of EI or the DT.

Conclusion

To be both effective and safe in their roles as UCOs or HS handlers, police officers need to be believed when they deceive suspects and/or criminals. Current selection processes do not include tests of lie production ability as the traits and abilities underlying deception effectiveness remain heretofore unidentified. This research investigated truth and lie production in police officers-in-training by comparing their DeceIT scores with personality traits (HEXACO and DT) and abilities (MSCEIT), finding that low social self-esteem was related to high lie production ability. No relationship was found between EI and either truth or lie production. Importantly, results also indicated that sex, age and DT traits were not related to either truth production or lie production. These results support equity for police applicants to deception-relevant domains, establishing that neither sex nor age should be included in selection criterion. Moreover, it suggests the vital requirement that policing selection processes should not select people with antisocial traits, but rather, should select traits that ensure credibility, trustworthiness for the officer, and more broadly trustworthiness for the organization. Finally, the findings reveal that further research is required to investigate individual extraversion, social skills, and confidence, and their relationship to 'storyteller' credibility and believability.

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ORCID iD

Monica Semrad https://orcid.org/0000-0003-3996-2859

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Author biographies

Monica Semrad is a PhD candidate at the University of the Sunshine Coast and an Australian Federal Police officer with 29 years of operational experience. Her honours thesis at Charles Sturt University focused on selection processes for witness protection officers. Her current research focus is selection processes for covert police officers.

Bridie Scott-Parker is an applied Social Psychologist at the University of the Sunshine Coast, Australia, with a strong interest in health and well-being of all individuals. Internationally-recognised for her pioneering research in pernicious problems such as road safety more generally and the road safety of adolescents specifically, she has a strong focus on translation from research to practice in all her endeavours.