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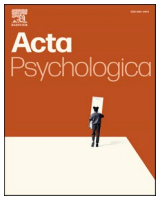

The tangled webs they weave: A scoping review of deception detection and production in relation to Dark Triad traits

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ABSTRACT

People deceive for different reasons, from avoiding interpersonal conflicts to preserving, protecting, and nurturing interpersonal relationships, and to obtaining social status and power. A growing body of research highlights the role of personality in both deception detection and production, with a particular focus on high Dark Triad (DT) traits (Narcissism, Machiavellianism and Psychopathy), for their shared tendency to engage in unethical self-benefitting behaviors, despite negative consequences for others. The main goal of the current scoping review was to bring together the studies investigating self-reported and performance-based deception production and detection performances, as presented in individuals characterized by high DT traits and point out the possible contribution of DT to deception research. To do so, we identified the relevant studies documenting the similarities and discrepancies between the three personality traits and presented their results, based on the procedure used for deception assessment: subjective or objective measurements for production / detection. Then, we discussed possible explanatory mechanisms for inter-individual differences in lie detection / production and argue for the contribution of DT to deception research beyond the typical personality models, particularly for the antisocial character of deception.

0. Introduction

Deceptive behavior is a pervasive social strategy (Bryant, 2008) with major costs for both interpersonal relationships and for society (Markowitz, 2021). Some people perceive themselves as better liars (Wissing & Reinhard, 2019), and it has been suggested that some personality traits might be beneficial for lie production (Wright et al., 2015). To test the assumption that personality can explain individual differences in deceptive performance, several studies focused on the Dark Triad (DT) traits; because of their shared tendency towards the manipulation and exploitation of others for personal gain, including deploying a wide variety of deceptive tactics (Paulhus & Williams, 2002). The current study aims to clarify whether individuals scoring high on DT traits (Narcissism, Machiavellianism, and Psychopathy) are indeed more proficient in lie production and detection, and to document potential discrepancies between their self-perceived and actual deceptive performance.

1. Deception: conceptual and methodological clarifications

Deception is conceptualized as a complex social behavior that takes many forms, occurs in many contexts, and arises for many reasons in everyday human interactions (Gamer & Ambach, 2014). It can be understood as *a deliberate attempt, whether successful or not, to conceal, fabricate, and/or manipulate in any other way factual and/or emotional information, by verbal and/or nonverbal means, in order to create or maintain in another or in others a belief that the communicator himself or herself considers false* (Masip et al., 2004, p. 148).

Despite the interchangeable use of the terms “deception” and “lying” (e.g. Vrij, 2000), some researchers propose a conceptual distinction between the two constructs (Mahon, 2008). Compared to lying, deception production entails a broader range of deceptive strategies, such as interpersonal manipulation (Paulhus & Williams, 2002), belief manipulation (Ettinger & Jehiel, 2010), strategic negotiation (Gaspar & Schweitzer, 2013), concealing, hiding, not revealing parts of the truth (Vrij et al., 2001), cheating (Dye & Solomon, 2021) misrepresentations, bluffs, falsifications (Erat & Gneezy, 2012) and other behaviors which

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may increase the deceiver's payoff at the expense of others. Some initial conceptual clarifications regarding deception-related concepts relevant to our paper are presented in Table 1.

Deception measurement approaches divide into two broad categories: (1) subjective (self-reports); (2) objective (measuring deception performance). Since complex laboratory procedures are required to objectively measure participants' deceptive performance, deception research often preferentially relies on self-report to register participants' perceptions of themselves or others when engaging in deception. *Subjective measures* imply the use of self-report tools which require participants opinions on various aspects related to deception, (frequency, motivation, intention, contexts, and types of preferred lies, stakes, acceptability, lie detection verbal and non-verbal cues), as well as vignettes (Eckerd et al., 2021) and hypothetical scenarios (Azizli et al., 2016), in which the participant is required to rate their willingness to use deceptive behaviors as a strategy to achieve their goals.

Although *self-report measures* provide useful information about internal processes that would otherwise be inaccessible, several biases are inherent to them. Firstly, recent evidence shows daily variation in the number of lies reported by participants, generating what was described as "good" or "bad" lie days (Serota et al., 2021)- therefore, catching just a unique snapshot of their perception might not be revealing for their general deceptive performance. Secondly, self-appraisals of objective performance may be biased by the participant's mood at that moment. For instance, it has already been demonstrated that lying generates emotions (Franck et al., 2008), such as anxiety (Visu-Petra et al., 2013). Thirdly, the suggested correlations between social desirability (a habitual tendency to present oneself favorably), lie telling frequency (Kashy & De Paulo, 1996) and self-interested lies (Buta et al., 2020) might additionally bias participants reports. In addition, there is always the possibility that individuals may genuinely misestimate or misrepresent their performance to preserve a socially desirable image (DeAndrea et al., 2012).

Alternatively, *objective measures* mainly rely on behavioral and psychophysiological indexes to detect deceptive behavior, including electrodermal, cardiovascular, and respiratory responses, such as those traditionally measured with the polygraph (Meijer & van Koppen, 2008). In addition to that, electroencephalographic, functional imaging (Sip et al., 2008) and other innovative procedures were later added to this arsenal (Gamer & Ambach, 2014). Participants in these studies are requested to detect deceptive behavior after watching video recordings with liars or truth tellers, online (Lyons et al., 2017; Wissing & Reinhard, 2017) or in the laboratory (Martin & Leach, 2013). Finally, the few existing ecologically valid procedures require participants to produce and/or detect deceptive behavior in direct social interaction contexts (Lyons et al., 2017; Wissing & Reinhard, 2017; Wright et al., 2015; Geis & Moon, 1981).

Table 1
Lying and deception detection/production. Conceptual clarifications.

Key term	Conceptual clarifications
Lying	= making a verbal believed-false statement (to another person) with the intention that that statement be believed to be true (by the other person) (Mahon, 2008)
Deception	= deliberate act of conveying false information (Nortje & Tredoux, 2019) and use of statements and/or behaviors, including acts of omission, that intentionally mislead a counterpart (Gaspar & Schweitzer, 2013)
Lie production	= making a believed-false statement (to another person), either with the intention that that statement be believed to be true (by the other person), and/or with the intention that it be believed (by the other person) that that statement is believed to be true (by the person making the statement) (Mahon, 2008)
Lying detection	= the assessment of a statement with the goal to reveal possible intentional deceit. Lie detection may refer to a cognitive process of detecting deception by evaluating message content, as well as non-verbal cues (Granhag et al., 2015)
Successful detection	= the correct discrimination between true and false statements (Bond, 2008) - usually quantified as a percent - the detection accuracy rate
Successful deception	= the successful deliberate attempt (without forewarning), to create in another a belief that the communicator considers to be untrue, in order to increase the payoff of the communicator at the expense of the other side (Vrij, 2000)
Deception production/detection Perception vs. Performance	Perception = participants' self-reported deception detection / deception production ability (Wissing & Reinhard, 2019) / Performance = participants' deceptive behavior assessed with objective measures (experimental procedures and tasks, (Wissing & Reinhard, 2017)

1.1. Deception motivations

People lie for different reasons, from avoiding interpersonal conflicts to preserving, protecting or nurturing interpersonal relationships, to gaining social status and power. Evidence shows that the intention behind the lie and the motivation for which the liar engages in deception production determines the pro-social or anti-social nature of the lie (Visu-Petra et al., 2022). This is because people usually judge the character of a lie based on three aspects: a liar's degree of awareness, their motives and effects on the parties involved (Knapp & Comadena, 1979).

DePaulo et al., (1996) proposed that lies can be either (1) *others-oriented*, told to protect or enhance someone else's interests, usually referred to as white lies and (2) *self-oriented*, told to protect the liar's interests. While the first ones are seen as benign, harmless, and acceptable, the latter are considered exploitative, harmful, and unacceptable (Bryant, 2008). The perceived effects of the self-benefit versus other-benefit situations seemed to moderate the willingness to use different deceptive strategies (Kim et al., 2008). Because of the negative implications for the parties involved and interrelations to many "dark" interpersonal behaviors (such as betrayal, cheating, or manipulation), in our scoping review we will focus mainly on the anti-social, self-interested type of deception.

1.2. Deception: production and detection

While most studies on lie detection and production were conducted within the legal field, where accurate judgments of veracity are paramount (Hartwig & Bond, 2014), deception was investigated in many other contexts such as romantic (Cole, 2001), economical (Ettinger & Jehiel, 2010), or organizational (Bachkirova, 2015). Most of them focused on one of the two aspects of deception (production or detection) and few addressed a potential *general deceptive ability*, which would entail both production and detection of lies for the same individual (e.g. Wright et al., 2012).

A seminal study documented the frequent use of lies in everyday life, with a mean of one or two lies per day (DePaulo et al., 1997). Most of these lies are told by *prolific liars*, who report telling five or more lies per every single white lie told by an average person (Serota & Levine, 2015). They are more inclined to use deception for personal interest and frequently characterized by aversive personality traits (Lyons, 2019). In addition to this, recent findings showed that individuals with this type of personality were more inclined to lie in day-to-day interactions compared to online settings, and they did it for selfish reasons (Markowitz, 2021), compared to most individuals from the general population, who reported telling zero lies on a given day (Curtis et al., 2021).

Despite the frequent use of lies, people were notoriously poor at

detecting deception (Bond & DePaulo, 2008) with detection accuracy rates close to 54% (Bond & DePaulo, 2006). Since deception is a cognitively demanding task, cognitive capacities may influence the perceived cognitive load in deception production tasks (Van't Veer et al., 2014) and better intelligence may assist the liars in managing their emotions during deception production, as well as increase the lie detector's focus on relevant cues when detecting deception in others. For example, Drouvelis and Pearce (2021) documented a positive relation between general intelligence and the use of white lies; Michels et al. (2020) showed that general intelligence was significantly related to lying ability, and Gaspar et al. (2021) suggested that enhanced emotional intelligence might benefit people to use, detect and respond to deception in organizational settings.

There was the assumption of so-called experts, or *"lie detection wizards"* (e.g. law enforcement), who claimed to have a 70–80% detection accuracy rate (O'Sullivan & Ekman, 2004). However, this reported accuracy was unsupported by Bond and DePaulo's (2006) meta-analysis, which showed no significant correlation between gender, age, education, experience, and confidence in detection accuracy. Similarly, Aamodt and Custer (2006) found that presumed experts (e.g. police officers, detectives, judges, and psychologists) failed to outperform the laypeople and suggested that experts might hold more stereotypical beliefs about deception clues (e.g. gaze aversion for law enforcement professionals). Furthermore, Reinhard et al. (2012) found that inducing a subjective feeling of experience (e.g. with a specific type of crime such as theft) in police officers increased their detection accuracy, even if they were objectively inexperienced, and they were more accurate in detecting true statements than deceptive ones. It was also suggested that people might develop sensitivity to lies related to their professional field, as example, therapists may be better at detecting emotion related lies, while police officers may be better at detecting crime related lies (O'Sullivan et al., 2009), although this assumption has not yet been empirically documented. In line with these findings, a previous systematic review of personality traits associated with being a *"good liar"* in policing contexts (Semrad et al., 2019) showed that certain traits, skills, and abilities behind sender demeanour (for instance, believability and honesty) might be essential to lie production and also suggested that the motivation to lie can influence deceiver's performance (e.g. researcher's instruction to lie might reduce participant's fear, guilt, and benefit successful deception).

Based on the assumption that deception production and detection skills might be improved via feedback, some researchers compared experts and criminals, and found that offenders obtained an enhanced accuracy rate in lie detection and held less stereotypical beliefs about the relevant cues to deception detection (Hartwig et al., 2004). A possible explanation might be that living in an unpredictable and harsh environment, made them more sensitive to specific environmental cues and affected their personality development, facilitating the acquisition of certain malevolent traits, such as Machiavellianism, Narcissism and Psychopathy (Birkás et al., 2020), which are known to have deception as a central component of their structure (Wright et al., 2015). Not surprisingly, these personality features are more prevalent in prison populations (e.g. Psychopathy, Coid et al., 2009).

In what follows, we will briefly outline the interrelations between typical personality traits, aversive personality and deceptive behavior, as a preamble to our scoping review on DT personality traits and deception.

2. Personality and deception

The Five-Factor model (FFM, McCrae & Costa, 2008) is a reference point in personality research, followed by the six-dimensional model of personality characteristics known as the HEXACO model (Lee & Ashton, 2014). The first documents the existence of five main dimensions: Neuroticism, Openness to Experience, Extraversion, Agreeableness and Conscientiousness (Barańczuk, 2021), while the second adds a new dimension: Honesty-Humility, conceptualized as the willingness to reduce one's fitness in favor of another persons' (e.g. by sharing resources, Zettler et al., 2021). Low levels of Agreeableness and low Honesty-Humility HEXACO were related to immoral and socially questionable behaviors and many researchers suggested they describe the core of dark personality (Dark Triad, Dinić & Jevremov, 2021; Dark factor, Zettler et al., 2021). Most relevant for deception research is the Agreeableness dimension, because of its correlation to deception detection (Elaad & Reizer, 2015).

Within the last decade, the study of "dark" personality traits received a lot of attention, starting from Paulhus and Williams (2002) who introduced the concept of a *"Dark Triad"* (DT) unifying subclinical Narcissism, Machiavellianism and Psychopathy. DT describes people who are prone to a wide range of antisocial and unethical behaviors (Kleinlogel et al., 2018) such as deception, greed, hypocrisy, and cunningness (Ashton & Lee, 2007), have low levels of guilt, shame, and fear (George et al., 2014) and are more willing to use deception and interpersonal manipulation for personal goals (Hart et al., 2021). The DT personality traits share a common *"dark core"* characterized by self-centeredness, deceitfulness, manipulation, and callous unemotional tendencies. Besides this common core, each dimension entails specific behavioral, attitudinal, and moral components, which determine their uniqueness (Jones & Figueredo, 2013), and all share a predisposition towards deceptive, unethical and antisocial behaviors, that may benefit oneself, despite negative consequences for others (Moshagen et al., 2018).

In comparison to the other members of the Triad (Machiavellianism and Psychopathy), individuals scoring high on sub-clinical *Narcissism* are characterized by egocentricity (Morf & Rhodewalt, 2001), grandiosity, excessive self-love, entitlement, dominance, superiority (Raskin & Hall, 1981), high levels of alertness and sensitivity to possible social status threats (Pfattheicher, 2016). They also endorse positive attitudes towards deceptive communication and consider deceptive skills as attributes that may serve well in social contexts (Kashy & De Paulo, 1996).

Individuals scoring high on *Machiavellianism* are described as cold, strategic, calculated, manipulative, and deceitful, with a cynical view of the world and a willingness to engage in manipulative and scheming strategies towards personal goal achievement (Jones & Paulhus, 2009). They are characterized by a duplicitous interpersonal style, cynicism, strong confidence in interpersonal manipulation, exclusive self-interest (Jones & Paulhus, 2009), social maneuvering (Baughman et al., 2014), a tendency towards the use of unethical behaviors, manipulation of others for personal goals (Set, 2020), attainment of money, power (Stewart & Stewart, 2006), and a preference for deceitful and duplicitous behavior to gain dominance (Fehr & Fischbacher, 2006). They describe themselves as impulsive, undisciplined, impatient, unambitious sensation-seekers, in addition to being suspicious, cynical and manipulative (Miller et al., 2019).

Individuals scoring high on *Psychopathy* are described as cold, callous, unemotional, non-empathetic (Hare, 1985), impulsive and antisocial (Williams et al., 2007) and are similar to individuals scoring high on Machiavellianism in the deceptive strategies they use (Muris et al., 2017). Compared to them, individuals scoring high on sub-clinical Psychopathy, are more aggressive, exploitative (Jonason & Webster, 2012) and antisocial (Williams et al., 2007). From all three members of DT traits, sub-clinical Psychopathy is the *prototypical example* for lying, deception, and manipulation (Cleckley, 1976; Cooper & Yuille, 2007) as a defining trait.

However, there is insufficient evidence to show whether individuals scoring high on DT traits are good liars or lie detectors (e.g. Wright et al., 2014). On the one hand, it is plausible that their frequent engagement in unethical behaviors purposes (the hallmark of all DT personality features) generates a better ability to produce and detect similar attempts in social interactions (Gino, 2015). From a phylogenetic point of view, the literature refers to them as socially adaptive, characterized by *"fast life"* strategies (Jonason & Webster, 2012) and more oriented towards self-

utility maximization (Moshagen et al., 2018), regardless of the costs of their behaviors for others. This pattern of egoistic behavior indicates their tendency towards using a *"cheater strategy"*, characterized by acting selfishly and employing of a wide variety of unethical strategies, for instrumental purposes. On the other hand, excessive focus on personal interest, egocentricity, and inability to read others' intentions (e.g. poor Theory of Mind, Oey et al., 2019), might decrease their lie production and detection abilities. Furthermore, if dark individuals, particularly individuals scoring high on Machiavellianism, assess that there are no benefits from using deceptive behaviors, executing them is too difficult or there is a big chance of getting caught, they prefer to refrain from using them to prevent negative consequences for themselves (Rauthmann & Kolar, 2012). Special populations such as offenders who reported considerably higher levels of Psychopathy, Narcissism, and Machiavellianism than non-offenders (Navas et al., 2021) were shown to perform significantly worse than non-offenders in accurately classifying true and deceptive messages (Schindler et al., 2019). Differences between results of the studies investigating DT in typical and special populations might be confounded by involving different DT measures, such as the composite score from the Short Dark Triad (SD3, Jones & Paulhus, 2014), or the Dirty Dozen (DD, Jonason & Webster, 2010).

Also, noted in their review that much of the DT research is inconclusive, since many studies were conducted on student groups (who received something in return for their participation) and draws our attention to the specificity of the measures used for DT constructs, both as total and as separate scores. They suggested that the existing measures for Machiavellianism do not measure Machiavellianism, per se, but another version of Psychopathy and studying the DT as a constellation fails to provide significant additional information (see also Glenn & Sellbom, 2015). Moreover, DT constructs might depend on the measure and the specific sub-dimension examined. Specifically, core elements of each sub dimension showed very different and sometimes even opposite relationships with other personality domains, observable only when the constructs were measured separately (Watts et al., 2017).

3. Methodology

A scoping review of the available evidence regarding deception detection and production in individuals scoring high on DT is warranted to examine, summarize, disseminate the existing findings, and identify research gaps in the literature (Daudt et al., 2013).

Towards its completion, we used Arksey and O'Malley's (2005) methodological framework for scoping reviews and followed five stages. First, we formulated the research questions, and then we searched, identified, selected the relevant publications, charted the data, summarized, and reported the results. In the end, we discussed each result, suggesting possible explanations.

The current study aims: (1) To bring together the studies investigating self-reported and performance-based deception production and detection in the DT personality traits, and (2) To document the contribution of DT features in explaining individual differences in deception production and detection, beyond the Five-Factor model of personality. We expand on the only existing previous attempt to review the existing literature on personality correlates of "good liars", Semrad et al. (2019), which was yet circumscribed to policing contexts (law enforcement, police). This previous review was also limited to empirical studies published between 1978 and 2018, and did not explicitly distinguish between self-report and objective measures of deception, mainly focusing on lie production.

To identify relevant studies, we conducted multiple computer-based searches on several electronic databases, including, but not limited to, ERIH PLUS, Psych Info, Web of Science and Science Direct and Google Scholar, using the keywords: deception, deception detection, deception production, lie production, lie detection, Dark traits, Dark Triad, deception production and deception detection. We excluded studies in which deceptive performances were measured only by psychophysiological/imaging methods (such as fMRI, polygraph, and other brain scans) and those using indirect measures for deception production /detection (Klaver et al., 2009), youth population (Peace & Sinclair, 2012), or written in a different language than English. After identifying and screening the publications according to our inclusion-exclusion criteria and removing the duplicates, 19 publications remained eligible for the current scoping review, from which 7 used self-reports to assess perceived deceptive skills and 12 using experimental tasks to measure deceptive performances, with 1 using both assessment tools (see Table 2 and Table 3 for a visual summary of the significant findings reported by all studies included).

4. Results

The tables below present the studies we identified as addressing the relation between DT traits and self-reported (Table 2) or performance-based (Table 3) measures of deception detection or production.

5. Discussion

We have so far summarized emerging findings on the interrelations between DT personality traits and deceptive behavior, based on the subjective or objective measurement of deceptive skills. As it can be observed, most studies with subjective measurement of deceit used SDT-3 and treated DT's dimensions as a unitary construct, compared to those which investigated the deceptive performance in an objective manner and mostly used separate measures for DT's dimensions. The results obtained from such traditional instruments, namely MACH-IV for Machiavellianism, NPI for Narcissism and SRP-III for Psychopathy, might be more reliable than those reported by the assessment of DT as a unitary construct (Furnham et al., 2013). One argument in this direction is that each DT trait maintains slightly different intrapersonal factors (Koehn et al., 2018). As previously noted, there might not even be three traits, but merely a combined Machiavellianism-Psychopathy dimension and Narcissism, in the case of both the SD3 and the DD measures (Persson et al., 2017). Hence, the recommendation of using separate long instruments for each Dark Trait (Kajonius et al., 2016).

5.1. Deception production

The majority of self-report studies investigated DT dimensions as a composite and showed that Machiavellianism and Psychopathy were frequently associated with different aspects of deception and are more similar in the "cheat strategy" they use, as suggested by the numerous correlations with intra/intersexual deceptive tactics (such as dominance, sincerity, superiority, indifference). In contrast, Narcissism was associated only with intersexual deception for dominance and appearance (Jonason et al., 2014). Specifically, they both reported increased lie frequency and propensity to lie across contexts in all studies (e.g. Baughman et al., 2014; Daiku et al., 2021), compared to Narcissism, in case of which results are mixed. Baughman et al. (2014) also found that all individuals scoring high on all three DT dimensions reported positive emotions when lying and those scoring high on Narcissism and Machiavellianism shared the belief that others will believe their lies.

In two studies, Narcissism was unrelated to the general propensity to lie (Azizli et al., 2016) and lie frequency (Daiku et al., 2021) while in another, it was associated with a willingness to lie in professional and academic contexts (Forsyth et al., 2021). One explanation in this regard may lie in their self-deceptive tendencies (Wright et al., 2015). When Narcissism was investigated as a separate dimension (Zvi & Elaad, 2018), differences were observed for the three subscales, meaning that different aspects of Narcissism related differently with aspects of deception, reinforcing the previous recommendation for using separate measurement tools for each construct, rather than assessing DT traits as a composite.

Table 2
The Dark Triad and self-reported deception.

Authors (year)	Dark traits (measures)	Deception (measures & indexes)	Participants, gender, mean age	Main findings
Deception production				
Baughman et al. (2014)	Dark Triad (SDT-3)	- Probability of lying in mating and academic contexts - Emotional state when lying (positive-negative) - Cognitive effort to lie successfully - Others' reactions (the degree to which they believed that the person being lied to: partner or lecturer, would believe their lie)	N = 462 130 men (19.4 years)	*Mating context:* - N was unrelated to probability of lying (r = 0.07, n. s.) and correlated with positive emotions when lying (r = 0.25**), increased cognitive effort (r = 0.18**) and belief that the partner will believe their lie (r = 0.11*) - M correlated with probability of lying (r = 0.10*), positive emotions when lying (r = 0.34**), increased cognitive effort (r = 0.15**) and belief that the partner will believe their lie (r = 0.13**) - P correlated to probability of lying (r = 0.13**), positive emotions when lying (r = 0.46**), increased cognitive effort (r = 0.14**) and unrelated to the belief that the partner will believe their lie (r = 0.06, n. s.) *Academic context:* - N correlated with probability of lying (r = 0.14**), positive emotions when lying (r = 0.28**), belief that the lecturer will believe their lie (r = 0.19**) and unrelated with increased cognitive effort (r = 0.08, n. s.) - M correlated to probability of lying (r = 0.25**), positive emotions when lying (r = 0.33**), increased cognitive effort (r = 0.28**) and belief that the lecturer will believe their lie (r = 0.16**) - P correlated to probability of lying (r = 0.19**), positive emotions when lying (r = 0.42**), increased cognitive effort (r = 0.10*) and the belief that the lecturer will believe their lie (r = 0.17**)
Jonason et al. (2014)	Dark Triad (SRP-III) (MACH-IV) (NPI-40)	Total number of lies in the last 7 days, number of people and number of - self-gain lies - white lies - no reason for lies (Self-rated lying ability) (DMTS) for intersexual and intrasexual deception	N = 447 from which 161 men (23.4 years)	- N correlated with total number of lies (r = 0.10*), self-gain lies (r = 0.20**), no reason for lies (r = 0.18*), and self-rated ability (r = 0.29**) and unrelated with the use of white lies (r = 0.06, n. s.) or the number of people lied to (r = 0.07, n. s.) - M correlated with total number of lies (r = 0.21**), the number of people lied to (r = 0.20**), self-gain lies (r = 0.12*), white lies (r = 0.13*), no reason for lies (r = 0.16*), and self-rated ability (r = 0.27**) - P correlated with total number of lies (r = 0.21**), number of people lied to (r = 0.25**), self-gain lies (r = 0.14*), no reason for lies (r = 0.26**), self-rated ability (r = 0.40**), unrelated with use of white lies (r = 0.07, n. s.) - Individuals scoring high on P and M were more similar in the "cheat strategy" (numerous correlations with intra/intersexual deceptive tactics, such as dominance, sincerity, superiority, indifference). In contrast, N was associated only with intersexual deception for dominance and appearance.
Azizli et al. (2016)	Dark Triad (SDT-3)	(PTLQ): Lying behaviors and propensity to lie in 2 scenarios: (1) mating (2) academic (CMI)	N = 464, 131 males 333 females (19.5 years)	- N unrelated to general propensity to lie (r = 0.03, n. s.) but correlated with lying in both mating (r = 0.15**) and academic (r = 0.17**) contexts. - M correlated with general propensity to lie (r = 0.12**) and lying in both mating (r = 0.21**) and academic (r = 0.30**) contexts. - P correlated with general propensity to lie (r = 0.15**) and lying in both mating (r = 0.19**) and academic (r = 0.21**) contexts. - All three DT traits correlated with total score for misconduct, as following: N (r = 0.16**), M (r = 0.22**) and P (r = 0.45**), and associated differently with CMI subscales, such as bullying, drug abuse, delinquency, and criminality.
Daiku et al. (2021)	Dark Triad (DTDD)	(Total number of lies in the last 24 h)	N = 340 (19.6 years)	The mean for lie telling in the last 24 h was 2.14 lies (SD = 4.64) Distribution of results: - 45.4% of participants reported no lies - 47.4% reported one to five lies - 7.2% reported six or more lies, which accounted for 47.2% of the total reported lies (154 out of 326 lies) = the "*a few prolific liars*" Lying frequency was correlated with P (r = 0.14**), M (r = 0.10*) and unrelated to N (r = −0.08, n. s.)
Forsyth et al., 2021)	Dark Triad (SDT-3) (SSIS)	Vignettes assessing the propensity to lie in three separate contexts: - professional - academic - relationship For each context: - Lying efficacy, - Cognitive load - Emotional response to lying (positive and negative)	N = 615 (26.8 years)	*Professional context:* - N correlated with propensity to lie (r = 0.18***), Lying Efficacy (r = 0.28***), cognitive load (r = − 0.24*), positive affect (r = 0.33***) and negative affect (r = −0.09*) - M correlated with propensity to lie (r = 0.38***), Lying Efficacy (r = 0.36***), cognitive load (r = − 0.17***), positive affect (r = 0.37***) and negative affect (r = −0.14***) - P correlated with propensity to lie (r = 0.23***), Lying Efficacy (r = 0.24***), cognitive load (r = − 0.25***), positive affect (r = 0.29***) and negative affect (r = −0.14***) *Academic context:* - N correlated with propensity to lie (r = 0.19***), Lying Efficacy (r = 0.31***), cognitive load (r = −0.18*), positive affect (r = 0.34***) and negative affect (r = −0.09***) - M correlated with propensity to lie (r = 0.39***), Lying Efficacy (r = 0.25***), cognitive load (r =

(*continued on next page*)

Table 2 (*continued*)

Authors (year)	Dark traits (measures)	Deception (measures & indexes)	Participants, gender, mean age	Main findings
				−0.19***), positive affect (r = 0.39***) and negative affect (r = −0.20***) - P correlated with propensity to lie (r = 0.23***), Lying Efficacy (r = 0.24***), cognitive load (r = −0.27***), positive affect (r = 0.29***) and negative affect (r = −0.17***) *Relationship context:* - N correlated with propensity to lie (r = 0.21***), Lying Efficacy (r = 0.18***), cognitive load (r = −0.08*), positive affect (r = 0.29***) and unrelated to negative affect (r = −0.03, n. s.) - M correlated with propensity to lie (r = 0.24***), Lying Efficacy (r = 0.24***), cognitive load (r = −0.11***), positive affect (r = 0.24***) and negative affect (r = −0.06***) - P correlated with propensity to lie (r = 0.15***), Lying Efficacy (r = 0.12***), cognitive load (r = −0.19***), positive affect (r = 0.19***) and negative affect (r = −0.11***)
Deception production and detection				
Zvi and Elaad (2018)	Narcissism NPI with 3 subscales: - LA - GE - EE	(LTAAS) Successfully lie-telling Convincingly truth-telling Successfully lie-detecting Believing other people Total number of lies in the last 7 days, number of people and number of - self-gain, - altruistic, - no reason lies	N = 125 (25.7 years)	Total N correlated with successfully lie-telling (r = 0.57**), convincingly truth-telling (r = 0.52**), successfully lie-detecting (r = 0.52**) and believing other people (r = 0.38**). Total N correlated with tendency to lie (r = 0.29*) the number of people lied to (r = 0.24**), and differences were observed for N's subscales, as following: - LA correlated with tendency to lie (r = 0.20*) and telling lies for no reason (r = 0.18*) - GE correlated with tendency to lie (r = 0.31*) and the number of people lied to (r = 0.31*) - EE correlated with tendency to lie (r = 0.29*), the number of people lied to (r = 0.21*) and self-gain lies (r = 0.19*) N dimensions were unrelated to telling altruistic lies.
Wissing and Reinhard (2019)	Dark Triad (SDT-3)	Three 7-point Likert-type scales: - Perceived deception detection ability - Perceived deception production ability - Behavioral cues of deception (22 statements based on the beliefs about cues of deception documented by Hartwig and Bond (2011)	N = 205 58.5% male 41.4% female (22–70 years)	- N correlated with perceived deception detection ability (r = 0.16*) and deception production ability (r = 0.33***) - M was unrelated to perceived deception detection ability (r = 0.12, n. s.) and correlated with perceived deception production ability (r = 0.45***) - P correlated with perceived deception detection ability (r = 0.14*) and deception production ability (r = 0.44***) No sig correlations between any of DT and cue-based detectability.

Note: * p < .05. ** p < .01, *** p < .001, n. s. = not significant, n.m. = not mentioned.
Personality: N = Narcissism, M = Machiavellianism, P = Psychopathy, S = Sadism, SDT-3 = Short Dark Triad (Jones & Paulhus, 2014), NPI = Narcissistic Personality Inventory, with three subscales: LA – Leadership/Authority, GE - Grandiose Exhibitionism, EE – Entitlement/Explosiveness (Raskin & Terry, 1988), MACH-IV = Machiavellianism Scale Version IV (Christie & Geis, 1970), DTDD = Dark Triad Dirty Dozen (Jonason & Webster, 2010), SSIS = Short Sadistic Impulse Scale (O'Meara et al. 2011), Deception: DMTS = Deceptive Mating Tactics Scale (Tooke & Camire, 1991), PTLQ = Propensity to Lie Questionnaire (Azizli et al., 2016), CMI = Comprehensive Misconduct Inventory (Paulhus & Williams, 2002), LTAAS = Lie-truth Ability Assessment Scale (Elaad, 2009, 2015).

Table 3
The Dark Triad and performance-based deception.

Authors (year)	Dark trait(s) (measures)	Deception tasks	Participants (mean age)	Findings (correlation coefficients, and statistical significance)
Deception production				
Geis and Moon (1981)	Machiavellianism (MACH-IV)	*Lie production* (Group 1) One half denied the knowledge of a theft, in which they had just been directly implicated; the other half made the same denial truthfully *Lie detection* (Group 2) Watched the 1.25 min videotape clips in random sequence and judged the veracity of denials	N = 360 64 Group 1 (G1) 64 Group 2 (G2) (n.m.)	Comparisons between individuals scoring high and low on M, revealed: - In the Lie condition, judges believed more the lies told by individuals scoring high on M, than they believed the lies told by those scoring low on M (F = 7.19, p < .01). No significant difference was observed in the truth condition considered alone (F = 0.15, n. s.) - Judges discriminated less accurately between individuals scoring high on M lies and truths, than in the case of those scoring low on M (F = 19.89, p < .001)
Martin and Leach (2013)	Psychopathy (PPI-R)	Selected videos of 15 lie-tellers and 30 truth-tellers. Lie- tellers had been prompted to cheat by the confederate, cheated on the test and denied cheating during the interrogation. Truth-tellers had not been induced to cheat, did not cheat, and denied cheating during the interrogation.	N = 117 from which 53 males, 64 females (19.8 years)	No correlations between global P factor, individual content scale scores and deception detection (all p > .05) Note: The sample included many individuals scoring high on P even when compared with criminal populations.
O'Reilly and Doerr (2020)	Narcissism (Resick) (NPI-16) (SINS)	(1) Lying = either failing to tell a car-buyer about a faulty water pump (scenario S1) or telling a co-worker that a recommendation option 2 gives the co-worker more credit (scenario S2) (2) Cheating in an online game of rolling the dice (3) Self-reported willingness to steal a charger	N = 401 (34 years)	- The three N measures were inter-correlated: - SINS correlated with Lying in S1(r = 0.26**), but not in S2, also with Cheating (r = 0.15*) and Willingness to steal (r = 0.19**) - NPI-16 correlated with Lying in S1 (r = 0.23**) and S2 (r = 0.24**), but unrelated to Cheating and Willingness to steal. - Resick was unrelated to Lying in both scenarios, but correlated with Cheating (r = 0.19*) and Willingness to steal (r = 0.27**)
Michels et al. (2020)	Dark Triad N (NARQ) M (MACH-VI) P (SRP-4) Intelligence (WAIS-IV)	*Lying ability* (LA) = indirectly measured by G2 (no of raters successfully misled / no of raters that judged the subjects' stories) *Lie production:* 50 students narrated three short stories that took place in the last 24 h, 2 true and 1 fictional, while videotaped in laboratory settings *Lie detection:* 13 raters were informed that one of the three stories was fabricated and requested to watch and judge which story was deceptive	N = 50 students (Group 1) N = 13 academic assistants/interns (Group 2) (22.6 years)	- P (Antisocial Behavior Subscale) correlated with LA (r = 0.30*), whereas other subscales did not. - M was unrelated to LA (r = −0.02, n. s.) - N was unrelated to LA (r = −0.09, n. s.) - Intelligence was unrelated to LA (r = 0.15, n. s.)
Deception detection				
DePaulo and Rosenthal (1979)	Machiavellianism (MACH)	*Deception production:* Participants were videotaped while describing someone they liked, disliked, felt ambivalent and indifferent about. *Deception detection:* Participants returned to judge one of these videotapes. They always judged a videotape on which they did not appear	N = 40 Students (n.m.)	- The ability to recognize deception when the speaker is hiding positive affect is not significantly related to the ability to recognize deception when the speaker is hiding negative affect (r = −0.18, n. s.) - Speakers who get caught lying by women also tend to get caught lying by men (r = 0.62** for positive affect and r-0.54** for negative affect) - High M were more successful at getting away with their lies than low M (F = 3.04, p = .09; d = 0.58) High M were especially successful at deceiving when pretending to dislike someone they genuinely liked, (F = 5.96, p < .05; d = 0.79)
Lyons et al. (2013)	Psychopathy (SRP-III) Primary P Secondary P	*Deception detection* On-line experiment presenting 26 clips (real-life high stakes appeals, 13 truthful and 13 lies, from international missing person websites Truth/False judgments required	N = 150 (21.1 years)	Sex moderated the relationship between P and lie detection: - In men, primary P was positively correlated with lie detection (r = 0.26**) - In women, primary P was negatively correlated with lie detection (r = −0.24*) - Secondary P was unrelated to lie detection in both men (r = −0.22, n. s.) and women (r = 0.18, n. s.)
Lyons et al. (2017)	Dark Triad (SDT-3)	*Deception detection* On-line experiment presenting 20 clips with real-life high stakes appeals, 10 truthful and 10 lies, from international missing persons websites Truth/False judgments were required	N = 347, from which 98 men (25.7 years)	In high stakes deception, results revealed sex differences when judging the veracity of emotional lies: - In men, only N correlated negatively with deception detection accuracy (β = −0.24, t = −2.30, p < .02). - In women, only M correlated positively with deception detection accuracy (β = 0.28, t = 3.46, p < .001)
Wissing and Reinhard (2017)	Dark Triad (DD)	*Deception detection* In an online experiment, the participants were instructed to watch 14 videos and decide, whether the candidate was telling the truth or lying	N = 207 59.9% female (29.0 years)	- No association between DT traits and deception detection. - P and the DT composite were associated with overconfidence in lie detection accuracy.

(*continued on next page*)

Table 3 (*continued*)

Authors (year)	Dark trait(s) (measures)	Deception tasks	Participants (mean age)	Findings (correlation coefficients, and statistical significance)
		Self-reported global confidence in detection accuracy (1 item: "How many of the 14 videos do you think you judged correctly?" rated on a Likert scale from 0 to 14)		
Schindler et al. (2019)	Dark Triad (NARQ) (MACH-IV) (SRP-III)	*Lie production:* (prior to the study) Truth condition: 10 participants witnessed a confederate stealing 10 euros. Lie condition: other 10 participants were asked to steal. Next, liars and truth-tellers were asked about the missing money, *Lie detection:* Students and offenders watched video-recordings and judged the veracity of the presented statements.	N = 20 males (n.m. /students) (liars/truth-tellers) N = 76 males Offenders (29.7 years) N = 43 males (25.2 years)	No significant correlations between DT and classification accuracy (all p > .35), judgement confidence (all p > .06) and correct beliefs about deception (all p > .35) Offenders had higher levels of N (F = 7.21, p < .008), M (F = 6.96, p < .009) and P (F = 53.05, p < .001) and both groups showed an equally strong truth bias (n. m.) Confidence in own judgement was negatively correlated with classification accuracy (r = −0.23*) and messages judged as true (r = 0.24*)
Deception production and deception detection				
Wright et al. (2015)	Dark Triad (NPI-16) (MACH-IV) (SRP-SF)	*Deception production and detection* Computer administered deceptive interactive task DeceIT, participants took turns making true or false 20–30 s verbal statements. While each participant completed 80 trials in the role of Sender, the rest of the participants were lie Detectors. Self-deception subscale (BIDR) Lie acceptability (RLAS)	N = 75 28 males 47 females (27.2 years)	DT traits were unrelated to the ability to produce lies which others found difficult to discriminate from the truth (deception production), or to discriminate truth from lies when judging others (deception detection). - M was correlated with Lie acceptability (r = 0.38**) - N was correlated with Self-deception (r = 0.25*) - Lie Acceptability was correlated with deception production (r = −0.24*).
(Semrad and Scott-Parker, (2020)	Dark Triad (SD3)	*Deception production and detection* Face to face DeceIT task, in which the participant (Sender) speaks (either the truth or a lie, depending on the card instruction) for approximately 20 s, attempting to convince other participants that it reflects their true opinion. Rest of participants: lie Detectors	N = 50 Australian Federal Police recruits (30.2 years)	No significant relationships were found between any DT measure and neither truth nor lie production.
Elaad et al. (2020)	Narcissism (NPI with 3 subscales: - LA - GE - EE)	(LTAAS) Successful lie-telling Convincing truth-telling Successful lie-detecting Believing other people *Deception production* A modified version of the original ultimatum game which manipulates deception, where participants were requested to deceive another to gain more points	N = 70 From which 42 males 28 females (24.6 years)	- The lie-telling ability assessment was the only significant predictor of deception production (β = 0.45, t = 3.38, p = .001) - All three N dimensions predicted deception. - LA contributed to self-assessed lie-telling (β = 0.29, t = 2.54, p = .012), lie-detecting (β = 0.29, t = 4.26, p < .001) and truth-telling (β = 0.40, t = 3.64, p < .001) but not to truth-detecting ability - GE contributed to self-assessed lie-telling (β = 0.40, t = 3.60, p = .001), lie-detecting (β = 0.47, t = 4.47, p < .001) and truth-telling (β = 0.38, t = 3.44, p < .001) but not to truth-detecting ability - EE contributed to self-assessed lie-telling (β = 0.31, t = 2.76, p = .007), lie-detecting (β = 0.40, t = 3.67, p < .001) and truth-telling (β = 0.45, t = 4.21, p < .001) but not to truth-detecting ability

Note: * p < .05. ** p < .01, *** p < .001, n. s. = not significant, n.m. = not mentioned.
Personality: N = Narcissism, M = Machiavellianism, P = Psychopathy, S = Sadism, SD3 = The D3 Short (Paulhus & Williams, 2002) SDT-3 = Short Dark Triad (Jones & Paulhus, 2014), NPI = Narcissistic Personality Inventory, with three subscales: LA – Leadership/Authority, GE - Grandiose Exhibitionism, EE – Entitlement/Explosiveness (Raskin & Terry, 1988), NARQ = Narcissistic Admiration and Rivalry Questionnaire (Back et al., 2013), WAIS-IV = Wechsler Adult Intelligence Scale – Fourth Edition (Petermann, 2012), Resick = eight adjectives descriptive of Narcissism (arrogant, assertive, boastful, conceited, egotistical, self-centered, show-off, and temperamental) (Resick et al., 2009), NPI-16 = Narcissistic Personality Inventory (Ames et al., 2006), SINS = Single-Item Narcissism Scale (Van der Linden & Rosenthal, 2016), MACH-IV = Machiavellianism Scale Version IV (Christie & Geis, 1970), MACH-IV = Machiavellianism Scale VI (Jones & Paulhus, 2009), SPR-4 = The Self-report Psychopathy Scale – Forth Edition (Paulhus et al., 2016), SRP-III = Self-Report Psychopathy Scale-III (Paulhus et al., 2009), SRP-SF = Sub-Clinical Self-Report Psychopathy Questionnaire Short-Form (Paulhus et al., 2016); BIDR (Self-Deception Scale of the Balanced Inventory of Desirable Responding, Paulhus & Reid, 1991).
Deception: DeceIT = The Deceptive Interactive Task (Wright et al., 2012), LTAAS = Lie-truth ability assessment scale (Elaad, 2009, 2015).

As noted, Machiavellianism and Psychopathy were associated with frequent lie telling and compared to Narcissism and Psychopathy, which characterized individuals who did not prefer using white lies (Jonason et al., 2014). Individual high on Machiavellian traits reported the use of all types of lies, such as self-gain, white and no reason for lies. One possible explanation might be their strategic nature and perceived self-efficacy in producing convincing lies (Forsyth et al., 2021). Interestingly, individuals scoring high on Machiavellianism and Psychopathy reported increased levels of cognitive effort while lying in both contexts (mating and academic), while individuals scoring high on Narcissism didn't consider lying cognitively demanding in mating contexts. Later on, when asked about the perceived cognitive load associated with lying in relational, professional, and academic situations, individuals scoring high on all DT reported decreased cognitive load (Forsyth et al., 2021), increased propensity to lie, more positive emotions, increased self-perceived efficacy and low negative affect when lying, suggesting that DT members share a preference for self-utility maximization in many contexts. Not surprisingly, DT personality traits correlated with a wide range of unethical behaviors such as bullying, drug abuse, delinquency, and criminality (Azizli et al., 2016).

In terms of objective measurements, there were mixed results. As already presented in Table 3, DT traits were unrelated to deception

production performances, measured separately (Wright et al., 2015) and as a unitary construct (using SDT-3, Semrad & Scott-Parker, 2020), in both general and prison populations (Schindler et al., 2019), meaning that individuals scoring high on DT were not better liars, although they frequently engaged in lie production and appealed to unethical strategies to achieve their goals.

Investigated separately, all dimensions of Narcissism predicted lie telling (Elaad et al., 2020) and three inter-correlated measurement tools for Narcissism related differently to deception production, cheating and willingness to steal (O'Reilly & Doerr, 2020), suggesting that personality assessment tools may influence the identified differences in deception detection.

There is only one study assessing Machiavellianism as a separate dimension, showing that individuals with higher levels of Machiavellianism were more successful in producing convincing lies than those with low levels (DePaulo & Rosenthal, 1979), but did not differ in producing truthful statements. Also, they were more skilled in producing successful lies about people they liked, compared to those who did not. One explanation might be their preference for white lies and their theatrical style, when deceiving (Jonason et al., 2014).

When Psychopathy was assessed with PPI-R, no correlations were observed between Psychopathy and lie production (Martin & Leach, 2013), compared to SRP-4, where a positive association was found between the antisocial aspects of the construct and lie telling (Michels et al., 2020). Since there were different measurement tools, it is unclear whether the significant association is attributable to Psychopathy's measurement tool or to the individual differences in deception production.

5.2. Deception detection

Two studies investigate DT's perceptions on deception detection skills, and most of the literature focused on investigating deception production. As observed, individuals scoring high on Narcissism and Psychopathy perceived themselves better at successfully detecting lies, but not those scoring high on Machiavellianism (Wissing & Reinhard, 2019). In case of Narcissism, results replicated when assessed as a separate construct, documenting a positive association between Narcissism, self-rated lie detecting ability, and increased confidence in their lie detection skills (Zvi & Elaad, 2018).

When deception detection performances were assessed with experimental tasks, in face-to-face interaction, Wright et al. (2015) failed to find a correlation between DT and increased deception detection performance (assessing personality with separate instruments: NPI, MACH-IV, SRP-III), similar to (Semrad and Scott-Parker, (2020) who assessed DT traits as a unitary construct (SD-3). Contrary to these results, when judging high stakes deceptive statements, males scoring low on Narcissism and women scoring high on Machiavellianism, proved to be better at deception detection (Lyons et al., 2017). A possible explanation in this regard may be that less self-centered and more strategic approach benefits when judging the emotional appeals of missing persons (Lyons et al., 2017). When Machiavellianism was investigated as a separate construct, individuals scoring low and high did not differ in the self-reported detection accuracy rate (Geis & Moon, 1981).

The only two studies investigating the link between Psychopathy and deception detection obtained divergent results. When personality traits were measured with the PPI-R, no significant correlation was found between Psychopathy and deception detection performances (Martin & Leach, 2013). However, there was a positive association between participant's confidence and performance in lie detection. When personality was assessed with SRP-III (designed for sub-clinical Psychopathy, in normal population), Primary Psychopathy positively correlated with deception detection in men (Lyons et al., 2013), supporting the idea that Primary Psychopathy is a male-typical adaptation strategy (Jonason et al., 2009).

6. Conclusions

Deception is part of our everyday life, and while many use it to protect the ones they care about, others use it to protect/benefit themselves, regardless of the costs for those around them. In addition to their frequent use, they even report enjoying it. These are the "few prolific liars" (Daiku et al., 2021), mainly responsible for the most lies being reported. A possible explanation for the use of deception either for altruistic or self-serving purposes, might lay in an individual's personality structure.

As recently shown, some dark personality traits, such as Narcissism, Machiavellianism and Psychopathy, are frequently associated with a wide range of unethical behaviors (Moshagen et al., 2018). For this reason, the current study, aimed to bring together their deception related perceptions, regarding lie frequency, willingness, propensity to lie, context preference, motivations, and their actual deception production/detection performances observed in experimental tasks. Presenting the similarities and discrepancies between self-assessed and observed performances indirectly explains the value of studying DT in relation to deception and why studying the typical personality is insufficient to understanding the antisocial character of deception. One argument in this regard is that low levels of Agreeableness (Ashton & Lee, 2007) and Honesty-Humility cannot fully predict the commonalities and specific differences between DT dimensions (Schreiber & Marcus, 2020), which relate differently to certain aspects of deception, as we earlier presented.

As a cautionary note, individuals with increased levels of dark traits may inflate their self-reported skills due to overconfidence in their lie detection ability (Wissing & Reinhard, 2017) and might have assessment bias due to their self-enhancement tendency (Schwardmann & Van der Weele, 2019). Although some studies documented DT members frequent lie-telling and enhanced self-perceived efficacy in successful deception (Forsyth et al., 2021), no significant relationship was found between deception production and DT's observed performances (Michels et al., 2020).Except for Narcissism, which was correlated with deception production when studied as a single construct, in both self-report studies (O'Reilly & Doerr, 2020) and experimental tasks (Elaad et al., 2020). Considering their antagonistic nature, willingness to maintain a socially desirable image, low stake deception and the social costs of getting caught when lying, there is the possibility that individuals high on DT might have refrained from lying, or chose not to obey the instructions.

When asked to detect deception in others, most studies failed to find a correlation between DT and enhanced deception detection, except for two, documenting the importance of Narcissism and Machiavellianism in detecting high-stakes deception (Lyons et al., 2013). In addition, it was suggested that individuals scoring high on Narcissism have a tendency to overestimate their deception detection skills (Elaad et al., 2020).

Although we found no study investigating the DT in relation to FFM/HEXACO models of personality and Deception in a unitary design, we mention that the Dark factor of personality (conceptualized as D: the core to all dark traits, including the DT members) predicts dishonest behavior over all five FFM dimensions (Moshagen et al., 2018). This result suggests the possible contribution of DT, beyond The FFM of personality and sustains the importance of studying the malevolent side of human nature in relation to unethical behaviors, such as deception.

As a general conclusion to this scoping review, there is a growing body of yet insufficiently systematic empirical evidence documenting whether high levels of DT traits might benefit a liar or enhance accuracy in deception detection. Additional research can significantly contribute to understanding individual differences in anti-social deception and provide a more comprehensive picture.

One possibility to be explored in future research is the multidimensional nature of the DT traits, given the existence of various factors (e.g. Grandiose vs. Vulnerable Narcissism; Primary and Secondary Psychopathy), which remained uncaptured by current studies (Wissing &

Reinhard, 2019). For instance, because Primary Psychopathy was associated with lie detection accuracy in men (Lyons et al., 2013), and most self-report studies used the SDT-3, which mainly reflects Secondary Psychopathy and Grandiose Narcissism (Jones & Paulhus, 2014), the presented findings might underreport associations with detection accuracy.

To conclude, an ideal way to study deceptive behaviors in relation to personality would require using both self-reports and peer-evaluations for the dark personality features and both self-reports and experimental tasks for deception production and detection. This would allow the researcher to compare participants' perceptions and performances, taking into account others' perceptions of them while also controlling for self-enhancement biases. In addition, to enhance the predictive power of DT assessment over typical personality traits, it might be helpful to study both typical (e.g. FFM) and aversive (i.e. DT, Dark factor) personality traits, concentrate more on the associations between subjective and objective measurements of deception, and focus more on high-stakes situations or competitive social interactions and risk populations (e.g.: prisoners).

CRediT authorship contribution statement

Andreea Turi: Theoretical framework, Conceptualization, Writing, Reviewing, Editing **Mădălina-Raluca Rebeleș:** Methodology, Investigation, Writing original draft, Visualization **Laura Visu-Petra**: Project administration, Funding acquisition, Resources, Supervision, Conceptualization, Methodology, Writing, Reviewing and Editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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