

MESTRADO INTEGRADO EM PSICOLOGIA  
DA JUSTIÇA E DA DESVIÂNCIA

# Psychopathy and Social Cognition: Identifying Sarcasm and Lies

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**M**

2022



Universidade do Porto

**Faculdade de Psicologia e Ciências da Educação**

**PSYCHOPATHY AND SOCIAL COGNITION: IDENTIFYING  
SARCASM AND LIES**

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Novembro, 2022

Dissertação apresentada no Mestrado Integrado em Psicologia, Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto, orientada pelo Professor Doutor ***Fernando Barbosa*** (FPCEUP)

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## Agradecimentos

Porque um trabalho desta envergadura não consegue nem pode ser feito sozinho, agradeço a todos os que se cruzaram no meu caminho, académico ou não, ao longo destes maravilhosos e difíceis 5 anos. Todos vocês tiveram um papel importante na construção deste trabalho, mas a alguns tenho o prazer de agradecer especialmente.

Ao Professor Doutor Fernando Barbosa por ter aceitado orientar este trabalho, pelos constantes conselhos, sugestões e rigor científico que sempre apresentou. Pela paciência e compreensão.

Ao Doutor Tiago Paiva pela paciência para as minhas questões infundáveis, pelo apoio constante e por tudo aquilo que me ensinou. Por todo o tempo despendido em torno deste trabalho.

À minha família, mas particularmente aos meus pais. Sem o vosso apoio incondicional, constantes sacrifícios, não me seria possível chegar onde estou hoje.

Aos meus avós por, apesar de não saberem muito bem o que é uma dissertação de mestrado, terem sido sempre um apoio constante, dando-me uma força incrível.

Às maravilhosas amigas que fiz na faculdade: Carol, Lisandra e Sara. Por terem estado ao meu lado em todos os momentos, principalmente aqueles de maior incerteza. Por terem percorrido este caminho comigo e nunca me deixarem ficar mal. A faculdade acaba, mas a amizade fica.

A todos os participantes, pela disponibilidade de contribuírem para este trabalho. Sem vocês não era possível.

À faculdade, aos meus colegas e aos docentes com quem tive oportunidade de aprender nestes 5 anos.

Às amigas antigas: Bia, Carolina, Joana, Margarida e Teresa, pela motivação que

nem sabiam que me davam naqueles cafés de sábado à noite.

Ao Paulo pela motivação constante, pelo exemplo de trabalho árduo e especialmente pelos chás e bolos.

Ao meu Francisco, pelo amor, carinho e apoio incondicional todos os dias.

## Resumo

A psicopatia é um construto estudado ao longo dos anos, mas muitas questões ainda permanecem sem resposta. A sua relação com a cognição social e com a identificação do sarcasmo e da mentira é uma delas. Com o objetivo de saber se níveis mais elevados de psicopatia predizem a identificação de comentários sarcásticos e enganosos, foram utilizadas regressões lineares simples e múltiplas para tentar compreender o fenómeno. Além disso, foram analisadas as correlações entre os *scores* de psicopatia, empatia e cognição social, para tentar entender qual é a verdadeira importância da empatia na cognição social. Recrutamos 66 participantes através de múltiplas redes sociais, que preencheram um questionário sociodemográfico, quatro questionários de autorrelato que incluíram a *Triarchic Measure of Psychopathy* (TriPM), o *Self-Report Psychopathy Scale – Short Form* (SRP-SF), o *Questionnaire of Cognitive and Affective Empathy* (QCAE), *Marlowe Crowne Social Desirability Scale* (MCSDS), terminando com o *The Awareness of Social Inference Test – Short* (TASIT-S). Regressões lineares simples entre os *scores* do SRP-SF e os *scores* da TASIT-S mostraram que psicopatia medida através do SRP-SF não parece prever uma pior identificação de expressões faciais, sarcasmo e mentiras. Ao medir a psicopatia através da TriPM, só foram encontrados resultados significativos na Parte 3 da TASIT-S. A ousadia parece prever uma melhor identificação tanto de comentários sinceros quanto enganosos, enquanto a desinibição parece prever uma pior identificação de comentários sinceros. Analisando a interação entre a empatia e os domínios da cognição social, não foi encontrada correlação. Em relação à psicopatia e à empatia, os resultados apontam para uma correlação negativa entre a empatia cognitiva e afetiva com a malvadez, bem como entre a empatia afetiva e a ousadia. No geral, os resultados mostram que a psicopatia não parece prever uma pior cognição social e que a empatia pode não ter um papel tão importante nas interações sociais como se pensava. No entanto, mais estudos com melhor validade ecológica precisam de ser desenvolvidos para que se possa entender melhor como indivíduos com altos níveis de psicopatia navegam interações sociais.

*Palavras-Chave:* psicopatia; cognição social; sarcasmo; deteção de Mentira; empatia

## Abstract

Psychopathy is a construct studied throughout the years, but multiple questions are still left unanswered. The relation with social cognition and the identification of sarcasm and lies is one of them. Aiming to know if higher levels of psychopathy predict the identification of sarcastic and deceitful remarks, both simple and multiple linear regressions were used to try to comprehend the phenomenon. Additionally, we analyzed the correlations between psychopathy, empathy, and social cognition scores, to try to grasp what is the true importance of empathy in social cognition. We recruited 66 participants via multiple social networks, who completed a sociodemographic questionnaire, 4 self-report questionnaires who included the *Triarchic Measure of Psychopathy* (TriPM), the *Self-Report Psychopathy Scale – Short Form* (SRP-SF), the *Questionnaire of Cognitive and Affective Empathy* (QCAE), *Marlowe Crowne Social Desirability Scale* (MCSDS), finishing with *The Awareness of Social Inference Test – Short* (TASIT-S). Simple linear regressions between SRP-SF scores and TASIT-S scores showed that psychopathy scores measured by the SRP-SF does not seem to predict a worst identification of facial expressions, sarcasm, and lies. When measuring psychopathy through the TriPM, there were only found significant results in TASIT-S Part 3. Boldness seems to predict a better identification of both sincere and deceitful remarks, while disinhibition seems to predict a worst identification of truthful ones. Analyzing the interaction between empathy and the domains of social cognition, no correlation was found. Regarding psychopathy and empathy, results support a negative correlation between both cognitive and affective empathy with meanness, as well as between affective empathy and boldness. Overall, our results show that psychopathy does not seem to predict a worst social cognition and that empathy may not have such an important role in social interactions as it was thought. However, more studies with improved ecological validity need to be developed to further understand how individuals with high levels of psychopathy navigate social interactions.

*Key words:* psychopathy; social cognition; sarcasm; deception detection; empathy

## Résumé

La psychopathie est une construction étudiée au fil des ans, mais de nombreuses questions restent encore sans réponse. La relation avec la cognition sociale et l'identification du sarcasme et du mensonge en est une. Visant à savoir si des niveaux plus élevés de psychopathie prédisent l'identification de remarques sarcastiques et trompeuses, des régressions linéaires simples et multiples ont été utilisées pour tenter de comprendre le phénomène. De plus, nous avons analysé les corrélations entre les scores de psychopathie, d'empathie et de cognition sociale, pour essayer de saisir quelle est la véritable importance de l'empathie dans la cognition sociale. Nous avons recruté 66 participants via de multiples réseaux sociaux, qui ont rempli un questionnaire sociodémographique, 4 questionnaires d'auto-évaluation qui comprenaient le *Triarchic Measure of Psychopathy* (TriPM), *Self-Report Psychopathy Scale – Short Form* (SRP-SF), *Questionnaire of Cognitive and Affective Empathy* (QCAE), *Marlowe Crowne Social Desirability Scale* (MCSDS), se terminant par le *The Awareness of Social Inference Test – Short* (TASIT-S). Des régressions linéaires simples entre les scores SRP-SF et les scores TASIT-S ont montré que les scores de psychopathie mesurés par le SRP-SF ne semblent pas prédire une pire identification des expressions faciales, du sarcasme et des mensonges. Lors de la mesure de la psychopathie par le TriPM, seuls des résultats significatifs ont été trouvés dans le TASIT-S Partie 3. L'audace semble prédire une meilleure identification des remarques sincères et trompeuses, tandis que la désinhibition semble prédire une pire identification des remarques véridiques. En analysant l'interaction entre l'empathie et les domaines de la cognition sociale, aucune corrélation n'a été trouvée. En ce qui concerne la psychopathie et l'empathie, les résultats soutiennent une corrélation négative entre l'empathie cognitive et affective avec la méchanceté, ainsi qu'entre l'empathie affective et l'audace. Dans l'ensemble, nos résultats montrent que la psychopathie ne semble pas prédire une pire cognition sociale et que l'empathie n'a peut-être pas un rôle aussi important dans les interactions sociales qu'on le pensait. Cependant, davantage d'études avec une validité écologique améliorée doivent être développées pour mieux comprendre comment les individus présentant des niveaux élevés de psychopathie gèrent les interactions sociales.

*Mots-clés:* psychopathie; cognition sociale; sarcasme; détection de tromperie ; empathie



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## Introduction

### 1. Psychopathy: history and development of the concept

According to the *Society for the Scientific Study of Psychopathy*, psychopathy can be defined as a constellation of traits that involves affective characteristics (lack of empathy, guilt, emotion attachment to others), interpersonal (superficial charm, dishonesty), impulsive (carelessness and recklessness) and antisocial behaviors (transgressions and law violations). Individuals with high levels of psychopathy are aware of their surroundings and reality and apparently rationales, being often confused with people with antisocial personality disorder.

Cleckley in *Mask of Sanity* (1941) deepened the concept of psychopathy and listed 16 characteristic features that defines the clinic profile of the so called psychopath: superficial charm and good “intelligence” (high IQ); absence of delirium and irrational thoughts; absence of nervousness and psychoneurotic manifestations; non reliability; tricky and insincere; lack of remorse and feelings of guilt; inappropriately motivated antisocial behavior; poor judgement and deficit in learning by experience; pathological self-centeredness and inability to love; general poverty in affective reactions; lack of insight; general deficit in responsiveness in interpersonal relationships; adverse behavior under the influence of alcohol and, sometimes, without it; suicide threats rarely carried out; impersonal, trivial and poorly integrated sex life and lacking in following a life plan.

Later, Hare (1991) took up a model, dividing psychopathy in two: primary psychopaths and secondary psychopaths with the factor analysis of the checklist he developed.

Primary psychopaths are seen as individuals who have constitutional deficits that lead to a cold and manipulative behavior, shallow relationships, and lack of negative affection such as guilt, fear, and anxiety (Dean et al., 2013). When analyzing with the four-factor model, it is composed by two facets: interpersonal and affective. The interpersonal facet is defined by superficial charm, grandiose sense of self-worth and pathological lying resulting in manipulative individuals (Gardner et al., 2018). The affective facet is defined by a lack of remorse, shallowness and a lack of empathy resulting in individuals with a failure to accept responsibility (Gardner et al., 2018). These individuals carefully plan their actions and view themselves as socially superior to others (Del Gaizo & Falkenbach, 2008).

Secondary psychopathy seems to anchor more on environmental causes such as parental abuse (Dean et al., 2013) and rejection, resulting in emotional issues linked to

neuroticism, impulsive behaviors, aggression, and emotional reactivity (Dean et al., 2013; Del Gaizo & Falkenbach, 2008). According to the four-factor model, it is composed by two facets: lifestyle and antisocial. The lifestyle facet defines individuals who need stimulation, have a parasitic lifestyle, with a lack of goals and who are impulsive and irresponsible (Gardner et al., 2018). The antisocial facet comprehends individuals with poor behavior control and early behavioral problems, such as juvenile delinquency, with criminal versatility (Gardner et al., 2018). Unlike primary psychopathy, here is seen negative affection (Del Gaizo & Falkenbach, 2008) through social anxiety, low self-esteem, introversion, and bad mood (Blackburn & Fawcett, 1999).

In 2009, Patrick and colleagues proposed the triarchic conceptualization of psychopathy dividing the concept in three dimensions that constitute different phenotypical manifestations: meanness, boldness, and disinhibition.

Meanness reflects the tendency to coldness, predatory aggression, and cruelty. Individuals whom this trait is predominant have trouble with impulse control, emphasis on immediate reward, and impaired behavioral restrictions. Regarding social behavior and interactions, there is a difficulty maintaining bonds and relationships with others and there is an exploratory search of power through cruelty without any regard for others (active untying). Behavior manifestations include recklessness, impulsive behaviors, distrust, tendency to develop substance abuse problems, lack of reliability, among others (Krueger et al., 2007). Despite being phenotypically different from boldness, they share the same etiological base: deficits in the fear system (Patrick et al., 2009).

Regarding boldness, this can be defined as a blend between low anxiety/low reactivity to stress, search for adventure, and high social dominance. These individuals are capable of remaining calm in front of tense, crucial or threatening events, being highly confident, and having a liking for taking risks. Behavior manifestations include *cold blood*, assertiveness, persuasion, resilience, resistance, among others. Boldness is considered an adaptive phenotypical expression and has the *low fear* factor in common with meanness (Patrick et al., 2009).

Ultimately, disinhibition can be defined by a lack of behavioral and emotion inhibition, reflecting a general tendency to deficits in impulse control, irresponsibility, anger, and hostility. There is a difficulty in planning, poor prediction ability and a deficit in affection adjustment. This dimension is moderately linked with meanness/cruelty, having a difficult temper as a common denominator (Patrick et al., 2009).

These three dimensions not only allow us to understand psychopathy in a seamless/embedded way, but can also be measured, conceptualized, and interpreted separately, boosting a dimensional view of psychopathy, according to which its inherent traits are present in the general population.

Regarding its relationship with social cognition, several studies have made clear that individuals with higher levels of psychopathy have some alterations in social cognition (Carroll et al., 2021). We still do not know (yet), what is the association between these modifications and psychopathy different facets and dimensions.

## **2. Social cognition, sarcasm and lies**

Social cognition can be defined as the ability to interpret and predict others' behavior, regarding not only intentions, but also beliefs, allowing us to interact in complex social situations (Baron-Cohen et al., 2000). It includes several processes from perception to decision making, guiding both automatic and volitional behavior (Adolphs, 2001). All these processes that help individuals "make sense of others' behavior" (Frith & Frith, 2007) can be clustered in three domains: perceptual processing of social information (emotional expressions and faces); grasping others' cognitive or affective states (social understanding); and planning behaviors taking into consideration others', in addition to one's own, goals (social decision making) (Arioli et al., 2018).

Firstly, the agent must be able to recognize others as living beings, through the analysis of perceptual information such as facial expressions, voice, and body language (Malle, 2005). So, being able to understand the cues present and their emotional content through facial and emotional expressions (Arioli et al., 2018) and to remember that emotional information are vital components of this construct (Adolphs, 2003; Grady & Keightley, 2002). This information will represent the input for higher-level processes underlying a direct resonance to others' affective states and/or the interpretation of their observable behaviors in terms of mental states and dispositions (Frith & Frith, 2012). Interpreting others' behavior in terms of mental states, such as beliefs, desires, intentions, goals, experiences, sensations, and emotions, is thus a critical step for predicting their future actions (Korman et al., 2015). So, the ability to process emotions in an efficient way and Theory of Mind (ToM) are crucial abilities to master. This will hopefully modulate decision making and lead the individuals to adapt his social behavior (Malle, 2004).

Social cognition, particularly ToM, is key to interpreting others, particularly when clues are provided that can have second meanings. For example, sarcasm is a form of figurative language (Katz et al., 2004) where the speaker says the opposite of what he really wants to say (Winner, 1998), usually with a distinct tone of voice so criticism can be made in a humorous way (Pexman, 2018). It is a variant of verbal irony (Colston, 2000), being its most cruel form (Muecke, 1980), having a caustic element directed to a specific victim (person or group) (Lee & Katz, 1998). Briefly, sarcasm is the most used form of irony to communicate criticism in an implicit way (Sperber & Wilson, 1986 cit. in Shamay-Tsory, 2005), presenting an element of ridicule that irony does not have (Lee & Katz, 1998).

To be able to identify sarcasm several authors emphasized the importance of context (Campbell et al., 2012), of tone of voice (Bryant & Foz Tree, 2005) and of facial expressions (Rockwell, 2001). Although, it is important to keep in mind that findings are not consistent.

Regarding context, it is viewed by some authors as extremely important in the understanding of sarcasm. The nature of the affirmation/statement is first analyzed regarding the context (Katz et al., 2004), because most of the times the sarcastic intent, is not apparent outside of it (Campbell et al., 2012). Techentin and colleagues (2021) claim that individuals take more time to identify sarcasm when there are incoherent blends of context and intonation. Other authors state that in a rich and defined context, understanding nonliteral language is the equivalent of understanding literal language (Giora et al., 2000).

When it comes to the importance of the tone of voice to interpret sarcastic messages, there is no agreement within the literature. On the one hand, empirical evidence suggest individuals can comprehend the meaning of sarcastic comments, without any specific tone of voice (e.g., Gibbs & O'Brien, 1991). On the other hand, Rockwell (2000) claims that vocal expressions of sarcasm exhibit a clear pattern of vocal cues such as higher lentification, as well as lower and deeper tone of voice compared to non-sarcasm. Having in mind that it conveys a more negative attitude, these vocal characteristics are associated with contempt and disgust (Rockwell, 2000). Voyer e Techentin (2010) also state that prosodic elements associated with sarcasm have a slower pace, deeper tone, more monotone speech with less resonance and clarity.

Concerning facial expressions and its importance in sarcasm recognition studies are very sparse, and findings are not consistent. Sarcasm seems particularly linked to expressions of disgust (Buck, 1984; Haiman, 2000). Rockwell (2001) found that participants specifically identify sarcastic expressions by the position of the mouth. Attardo and colleagues (2003) refer to a "blank face" or devoid of expression as normally being used in

the production of sarcasm. Having this in mind, we can say that there could be some discrepancy in facial expressions of sarcasm. Frischen and colleagues (2008) emphasize that facial expressions are paramount in interpersonal relations and provide valuable social information. There is a tendency for expressions to be processed in a pre-attentional level, which rapidly allows a global perception of the interlocutors' mood. Therefore, facial expressions can provide the first signs of sarcasm being present in the conversation because prosodic and semantic information are only processed in a higher level (Tschentz et al., 2021).

Like sarcasm, lies are also common elements of social interaction. Lying is the intentional telling of an untruth. It is typically committed when a person realizes that the truth violates another person's expectations (Millar & Tesser, 1988) and it is often used to avoid social conflict, preserve relationships or to achieve power (Turner et al., 1975).

When it comes to detecting lies, Vrij (2008) claims this is a hard task, given that there is no suggestive physical clue, like a growing nose. Even without such clue, there are several signs, such as verbal and especially nonverbal behavior which are central in deception detection (Burgoon & Buller 1996; Vrij, 2000). Ekman (1992) refers three key emotions usually related to lying: guilt (can lead to eye avoidance); fear; and excitement (leads to more smiles and over all movements) (Vrij, 2008). Yet, several authors refer that there are no clear verbal or nonverbal cues related to deceit (DePaulo et al., 2003; Vrij, 2005). Interestingly, Zloteanu and colleagues (2020) found that being able to recognize facial expressions does not bring any advantage in detecting deception. Information from third parties and understanding the context are, in some cases, more important in lie detection (Park et al., 2002).

In addition to contextual and biological components associated with brain structures, to understand both sarcasm and lies seem to be important when it comes to understanding the intentionality of the individual's beliefs and what the transmitter understands as the listener's beliefs (Dews & Winner, 1997). This entails the understanding of intentions conveyed in the situation, demanding social cognition processes, empathy, and ToM (Shamay-Tsoory, 2005).

Empathy is the ability to recognize someone else's feelings, experience them and respond in a correct way, being a fundamental part of the emotional social fabric (Dvash & Shamay-Tsoory, 2014). It is a multidimensional phenomenon which involves both affective and cognitive components (Davis, 1996; Hoffman, 2000). Affective theory of mind is strongly linked to affective empathy while cognitive theory of mind is associated to

cognitive empathy (Blair, 2008; Rankin et al., 2005; Shamay-Tsoory & Aharon-Peretz, 2007). To be able to behave emphatically it is fundamental to understand and represent other people mental states as thoughts, wishes, and hopes (Batson et al., 1987). Beyond that, to ensure that social interactions are adequate, is imperative to infer on other people thoughts and feelings (Dvash & Shamy-Tsoory, 2014). Understanding beliefs does not mean understanding emotions and therefore empathize (Davis & Stone, 2003). That is why it is important to talk about ToM.

Theory of Mind (ToM) (Leslie, 1987) is the ability to represent someone else's mental state in a way this triggers an affective and empathic response (Batson et al., 1987). This capability allows the individual to understand and predict other people behavior and react accordingly (Dvash & Shamay-Tsoory, 2014). This theory is divided in two components: affective which involves thinking about feelings and cognitive which involves thinking about thoughts, intentions, and beliefs (Dvash & Shamy-Tsoory, 2014).

It is noteworthy, that there are studies suggesting that empathy does not affect the identification of sarcasm and lies. Rockwell (2003) found that empathy, did not affect the recognition of sarcasm. Svetieva and Frank (2016) found that being more empathic leads to a better classification of emotional cues, but it also leads to poorer judgements regarding deception, but it also leads to poorer judgments regarding deception (Baker et al., 2013; Israel et al., 2014). Zloteanu and colleagues (2020) found a negative relationship between empathy and detection of deception, seeing it can be detrimental in deceptive scenarios. So, even though empathy seems crucial in social interactions, its role in identifying sarcasm and lies is unclear.

### **3. Current study: psychopathy, sarcasm, and lies**

As we saw early, sarcasm and lies are a part of the social interactions and require a very strong ability to navigate through human interactions, including recognizing facial expressions, ToM, and empathy emotional intelligence, and empathy (Lyons et al., 2013). Do individuals with high levels of psychopathy have what it takes to be successful in this endeavor?

Several studies have shown deficits in individuals with high levels of psychopathy regarding recognition of facial expressions of emotion, particularly fear, sadness, (Blair et al., 2004; 2008; Blair et al., 2001), and disgust (Kosson et al., 2002). Psychopathic individuals show reduced autonomic responses associated to anger and disgust (House &

Milligan, 1976; Blair, 1999). Stevens and colleagues (2001) report that children with callous-unemotional traits show a deficit in both facial expression and vocal recognition of fear and sadness. Blair and colleagues (2001) as well as Dadds and colleagues (2006) have shown that deficits in recognition of the facial expression of fear is widespread to non-criminal psychopaths. Contrarily, Glass and Newman (2006) did not confirm differences in the identification of facial expression between psychopaths and non-psychopaths.

A meta-analysis, by Marsh and Blair (2008), found evidence of a strong connection between antisocial behavior and deficits in the recognition of facial expressions of fear, sadness, and surprise, suggesting an amygdala disfunction. A subsequent meta-analysis by Dawel and colleagues' (2012) suggests widespread/broader deficits affecting both facial and vocal recognition of fear, happiness, and surprise, as well as difficulties in facial recognition of sadness. More recently, Prado and colleagues (2015) observed that primary psychopathic traits are related to recognition deficits of facial expressions of disgust, shame, sadness, and fear, while secondary traits are linked to a deficit in disgust and shame recognition.

Thus, evidence seems enough to conclude that individuals with high levels of psychopathy show difficulties in the recognition of facial expressions of fear, sadness, and disgust. These individuals also present deficits in recognizing tones of voice associated with the said emotional expressions. The difficulties recognizing emotions could mean they are less equipped to understand social interactions and therefore can have more trouble identifying sarcasm and lies.

Results of previous studies are also contradictory regarding ToM and empathy in psychopathy. There are studies pointing out to nonexistent deficits such as Nelson and colleagues (2003) who reported that individuals considered psychopaths can be able to use their emotions to guide their own behavior and read other people's emotions. Richell and colleagues (2003) claim that individuals with psychopathy considered at a clinical level do not show deficits regarding ToM compared to non-psychopathic controls. Other authors reached the same conclusion: psychopathic individuals have a relatively normal performance in classic tasks of ToM (Jones et al., 2010; Shamay-Tsoory et al., 2010; Dolan & Fullam, 2004) supporting the idea that individuals with high levels of psychopathy have a normal performance while adopting others perspective (Dayton et al., 2018).

Instead, Dolan and Fullam (2004) found empathic deficits in individuals with psychopathy considered to be at a clinical level. Andrew and colleagues (2008) and Mahmut and colleagues (2008) indicate that nonclinical psychopathy is negatively associated with



empathy in general and can also be linked to an inappropriate empathic response to affective stimuli (Ali et al., 2009).

Other studies pointed out deficits in individuals with psychopathic tendencies regarding affective empathy, but not cognitive empathy (Blair, 1996; Dolan & Fullam, 2004). Palermo (2012) claimed that individuals with psychopathy experience empathy, being aware of emotions by exploring them and mimic them, without truly feeling them. This proficiency regarding cognitive theory of mind is not surprising considering that one of the prime characteristics of individuals with high psychopathic traits is their ability to manipulate (Hare, 2003) and trick others (Austin et al., 2007). Campos et al (2020), reported that, overall, higher levels of psychopathy lead to deficits in affective empathy, almost double of cognitive empathy, being deficits most negatively associated with affective than cognitive empathy. Looking in a more detailed way, antisocial traits present more deficits in cognitive empathy but in the extreme scores. Facet 2 of SRP-SF and meanness have a more general deficit and in boldness, cognitive empathy seems to be intact but there seem to be deficits in affective empathy.

Looking through this dichotomy between cognitive and affective empathy from a triarchic point of view, it was found a negative association between both boldness and meanness, and empathic concern. Interestingly, meanness is negatively associated with empathic concern, and with personal suffering, but positively associated with perspective taking. (Almeida et al., 2015).

When it comes to sarcasm and psychopathy, no studies were found between the interaction of these two concepts. However, if we view sarcasm as a form of negative humor used to harm others, to manipulate social situations (Lee & Katz, 2009; Pexman, 2018), or to *get ahead* (socially ascend) (Jonason & Fletcher, 2018), Reidy and colleagues (2007) found a connection between psychopathy and the use of negative humor. Lobbestael e Freund (2021) also found a connection between aggressive humor and psychopathy, and Martin and colleagues (2012) found a positive relationship between both primary and secondary psychopathy, and negative humor styles. On the other hand, Proyer and colleagues (2012) found mixed results: some individuals with high levels of psychopathy are able to use humor, even when maladaptive, while others appear to be humorless. It is also important to have in mind that Hare's (1999) described psychopaths as often witty and amusing, which can mean that they are able not only to identify and understand humor, but to use it, possibly for their advantage.

Regarding lie detection and psychopathy, there are different views. Some authors suggest that individuals with higher levels of psychopathy, in spite their deficits in social cognition and emotional intelligence, can have enhanced abilities to detect lies (Boddy, 2006), using them as a cheater-strategy (Bergmüller et al., 2010; Glenn et al., 2011). In fact, if psychopaths are more used to lying and deceiving, they would be able to identify the lies better on other people. In the same vein, it also found a negative relationship between high scores on emotional empathy, interpersonal agreeableness, trust, sociability, and lie detection (Campbell & Porter, 2002; Peace et al., 2010) which favors individuals with high levels of psychopathy. Conversely, Klaver et al. (2009) concluded that psychopathy is negatively related to successful deception. The deficits in assessing verbal and nonverbal expressions of emotion found in individuals with high levels of psychopathy could explain their difficulty identifying lies (Dolan & Fullam, 2006; Newman et al., 2004). So, it cannot be safely assumed that individuals who have higher traits related to manipulation and social dominance will have less trouble identifying lies.

Bearing the existing evidence in mind, all the hypotheses presented in this study are exploratory.

When thinking about psychopathy, most studies stating that individuals who present higher levels will have more trouble in social interactions and social cognition are based on Hare's model (1991). The SRP-SF is a scale created directly from the Hare's Psychopathy Checklist-Revised (PCL-R), having the 2-factor model in mind, reinforcing more inadapative traits of psychopathy (Gordts et al., 2015). Therefore, we can expect, that higher levels of psychopathy in the SRP-SF scale predict increased difficulties in identifying facial expressions of emotions (Hypothesis 1), sarcasm (H2) and lies (H3).

Exploring the abovementioned associations via the triarchic conceptualization, Patrick (2009) focused on certain aspects of psychopathy that can be adaptive in the social world, such as social dominance, low levels of stress and manipulation, besides the antisocial behavioral. These traits are particularly present in the boldness dimension of psychopathy. Individuals showing high boldness seem to be more adapted to society than individuals who score higher in other traits because this construct, namely meanness and disinhibition, which are related with a lot of thriving social characteristics. is related with a lot of thriving social characteristics. Therefore, we expected boldness to predict better performance in the identification of facial expressions of emotion (H4), sarcasm (H5), and lies (H6) than meanness and disinhibition. Following this train of thought, higher levels of meanness predict worse identification of facial expressions of emotion (H7), sarcasm (H8) and lies

(H9) and higher levels of disinhibition predicts worse identification of facial expressions of emotion (H10), sarcasm (H11) and lies (H12).

Additional analyses were also conducted in order to explore the relationships between (a) the dimensions of the triarchic model of psychopathy (boldness, meanness, and disinhibition) assessed by the TriPM, (b) empathy (cognitive and affective) assessed by the QCAE, and (c) the domains of social cognition assessed by the TASIT-S (emotion identification, sarcasm, lying). This could help not only to interpret the results, but also clarify the true importance of empathy in social cognition.

## Method

### 1. Sample

For this study, individuals of all genders, backgrounds and between the ages of 18 and 50 were invited to participate. They were recruited from the community through social networks and by email.

The size of the sample was estimated by the G\*Power 3.1 tool software (Faul et al., 2009). Considering the statistical methods that were planned (correlations linear and regressions) the sample size should vary between 89 and 115 participants (Faul et al., 2009), with a power of .80 and moderate effect size, but due to the COVID-19 Pandemic, only 66 adult individuals took part in the study (39 female). Participants' age ranged from 18 to 38 years ( $M = 27.79$ ,  $SD = 4.21$ ). All participants were fluent in Portuguese. Most of our participants completed high school (66.7%), followed by bachelor's degree (22.7%), master's degree (9.1%) and middle school (1.5%). Most of our sample is constituted by students (68.2%), followed by working students (16.7%), working individuals (13.6%), and one participant with no occupation (1.5%).

### 2. Materials

***Sociodemographic Questionnaire.*** A sociodemographic questionnaire was administered to characterize the sample regarding age, gender, nationality, mother tongue, and academic qualifications. Questions were also made regarding job status, laterality, sensory impairments (and whether corrected or not), history of mental illness, alcohol and drug consumption, medication, sleeping habits, and recent shifts in health or routines worth mentioning.

***The Awareness of Social Inference Test - Short (TASIT-S).*** The TASIT-S (McDonald et al., 2017) was used to evaluate social cognition through the understanding of social cues. The stimuli are small videos, where professional actors engage in regular conversations. By using these videos there is a better mirroring with the social interactions that occur on a daily basis.

This test has three parts: emotions evaluation; minimal social inference; and improved social inference.

Part 1 – Emotion: this part is composed by 10 videos that include two neutral expressions, two anxious, three of disgust, one of anger, one of sadness, and one of happiness (videos 3, 4, 9, 13, 14, 18, 19, 22, 25, 27). The videos regarding the emotion of surprise were removed from the Portuguese version because of their poor psychometric properties. The main goal is for the individual to identify the emotion present in the video. The way the actors act gives clues through facial expression, tone of voice, body, and gestural movement about the emotion that is present. After each scene, the participant must choose which emotion is present between seven forced-choice options: neutral, happiness, sadness, anger, disgust, anxiety, and surprise.

Part 2 – Minimal Social Inference: has nine videos divided in three different interactions: sincere interaction (1, 4, 11, and 14), simple sarcasm (2, 10, and 13), and paradoxical sarcasm (5 and 15). While in simple sarcasm the only cues are based on the actor's behavior, in paradoxical sarcasm the content only makes sense if the actor is being sarcastic. This part assesses the participants ability to determine intention, attitude, and the meaning of the interaction present in the scene, based on the dialogue, emotional expression, and other linguistic cues, without any other extra information.

Part 3 – Improved Social Inference: has nine videos, four of which evaluate lies (7, 13, 15, and 16) and five evaluate sarcasm (2, 4, 9, 10, and 12). In the case of videos that convey sarcasm, the literal message is the opposite of what the actor wants to convey, while in the case of videos displaying lies, the actor's objective is that the message s/he conveys is believed by the interlocutor, despite being the opposite of what s/he is saying. In this part, the evaluation of interactions is done with the help of extra information, so that the participant can understand the veracity of the interaction. For this, there may be visual clues or a preface that allows understanding the context of the interaction and the veracity of the speech.

Both Part 2 and Part 3 are assessed via four probe questions: what is the speaker doing to the other person?; what is the speaker trying to say?; what is the speaker thinking?; and what is the speaker feeling?.

Three different scores are computed from the three different parts. In Part 1 it is obtained a score for positive emotions by adding up neutral and happy responses, a negative score by adding sad, angry, anxious, and revolted, and a total score by adding the previous two. In Part 2 and Part 3 there are four scores to each question type (do, say, think, feel) which encompasses the total score for item allowing to obtain a score for the videos of each type. In Part 2, it is computed a score for the sincere videos, sarcastic videos, and for Part 2

total (sum of the previous two). Part 3 provides a score for deceitful, sarcastic remarks, and Part 3 total (sum of the previous two). These scores provide measures on the participants' ability to identify and understand facial expressions of emotion, as well as sarcastic, truthful, and deceitful remarks. The TASIT has good internal consistency as evidenced by Rasch item reliability estimates which are higher than .89 in all parts (Honan et al., in press).

***Triarchic Measure of Psychopathy (TriPM).*** The TriPM is a self-report instrument based on the triarchic model of psychopathy proposed by Patrick et al. (2009). It consists of three subscales: disinhibition (20 items); meanness (19 items); and boldness (19 items). A 4-point Likert scale is present per item: true; moderately true; moderately false; and false. The scoring is performed according to the Portuguese translation and adaptation study, providing a total score and separate scores for the three factors, namely boldness, meanness, and disinhibition (Vieira et al., 2014). The Portuguese version has shown good psychometric properties, with Cronbach's  $\alpha$  ranging from .81 to .86 (Paiva et al., 2020). In the present sample, a Cronbach's  $\alpha$  of .85 was obtained for the total scale, .78 for the boldness subscale, .79 for meanness, and .80 for disinhibition.

***Self-Report Psychopathy Scale – Short Form (SRP-SF).*** The SRP-SF (Paulhus et al., 2009) is a 28-item scale based on Hare's two-factor, four-facet structure of psychopathy (Massa & Eckhardt, 2017). There are four subscales: interpersonal (7 items); affective (7 items); lifestyle (7 items); and antisocial (7 items). These items assess different types of characteristics present in psychopathy, either considered adaptative or maladaptive (Gordts et al., 2017). The Portuguese version (Seara-Cardoso et al., 2020) has shown good psychometric properties ( $\alpha = .87$ ). The Cronbach's  $\alpha$  in the present sample was .86 for the total scale.

***Questionnaire of Cognitive and Affective Empathy (QCAE).*** The QCAE (Queirós et al., 2018) is a 30 item self-report measure of cognitive and affective empathy. Responses are given on a 4-point Likert scale ranging from 1 (strongly disagree) to (4) strongly agree. The affective empathy subscale assesses the ability to be sensitive and to vicariously experience another's emotional state, whereas the cognitive empathy subscale assesses the ability to form an understanding of another's internal emotional state. The affective empathy subscale is subdivided into Emotion Contagion (4 items), Proximal Responsivity (4 items), and Peripheral Responsivity (3 items), while the cognitive empathy is divided in Perspective Taking (10 items) and Online Stimulation (9 items). The Portuguese version has shown good psychometric properties, with a Cronbach's  $\alpha$  ranging from .62 to .87 (Queirós et al., 2018). The Cronbach's  $\alpha$  in the present sample was .89 for the total scale.

*Marlowe Crowne Social Desirability Scale (MCSDS)*. Social desirability was screened using the short form of the MCSDS (Ballard, 1992). This instrument is a 13-item measure of individual-level social desirability bias. Since deception, manipulation, and presenting themselves in a more positive light is one of the hallmarks of psychopathy, this scale is of utmost importance. Individuals with higher level of psychopathy are not only more likely to engage in positive impression management (Ray et al., 2013), but also have a lack of insight into the nature and extent of their problems (Cleckley, 1988). This scale was specifically used to identify the possible effects of the psychopathy traits in self-report scales. Although the Portuguese version has shown good internal consistency ( $\alpha = .79$ ) (Pechorro et al., 2012), the Cronbach's alpha  $\alpha$  for the total scale was poor (.55).

### **3. Procedure**

The study received a favorable appraisal by the institutional Ethics Committee. The data collection took place between January 2022 and July 2022. All participants were evaluated individually, after informed consent.

The data collection was part of a larger study being conducted at the Laboratory of Neuropsychophysiology of the University of Porto. Besides the TASIT-S, TriPM, SRP-SF, QCAE, and MCSDS, several other instruments were administered in the said study: State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA; Ree et al., 2008); Adult Temperament Questionnaire (ATQ; Evans & Rothbart, 2007); Altruism Attitudes Scales (Loureiro & Lima, 2009), Fear of Compassion (FoC; Gilbert et al., 2011). The larger study also included recording of EMG data at the end of the data collection.

Data collection sessions took about 90 minutes, and all the instruments were administered via a portable computer using Limesurvey version 5.2.8 (LimeSurvey GmbH, Hamburg, Germany). Participants responded always in the same order, starting with the sociodemographic questionnaire. Then, the participants completed the TASIT-S, watching the videos in the same computer, while the researcher filled out their answers in another one.

All statistical analyses were performed using the Statistical Package for Social Sciences, version 27.0 (IBM SPSS Statistics, Chicago, IL). Preliminary analysis focused on analyzing sample distribution. The normality of all the measures was tested with the Shapiro-Wilks test, being boldness and social desirability scores the only ones that were normally distributed. Thus, we also analyzed skewness (Sk) and kurtosis (Ku) using as a guideline  $|sk| < 3$  and  $|Ku| < 10$  (Kline, 2016). Two variables with kurtosis values out of Kline's guidelines

were log10 transformed to normalize their distributions. The internal consistency of the instruments when used in this sample were also computed, and previously described. The minimum Cronbach  $\alpha$  value for considering internal consistency acceptable was .70 (Dancey & Reidy, 2017). There were no missing data in instruments administered.

Before testing our hypotheses, we analyzed the correlation between the various dependent variables and the scores of MCSDS as a way to screen out the possible influence of social desirability on the results. As no significant correlations were found, the MCSDS scores were not considered in further analyses.

To test the first hypothesis, a simple linear regression was used, entering with psychopathy (total score of SRP-SF) as predictor and the participants' performance in the emotion identification task as outcome variable. The same procedure was used with the other hypotheses using scores for Part 2 (sincere and sarcasm) and Part 3 (lies and sarcasm) as outcome variables. Three linear regressions were conducted for each of the TASIT-S parts. In Part 1, two outcome variables were used: the number of positive emotions correctly identified (*correct positive*) and the number of negative emotions correctly identified (*correct negative*). In Part 2, the outcome variables were: identification of sincere remarks (*Sincere*) and identification of sarcastic remarks (*Sarcasm Part 2*). In Part 3, the outcome variables were: identification of deceitful remarks (*Lies*) and identification of sarcastic remarks (*Sarcasm Part 3*).

Concerning the hypotheses based on the triarchic model, the same analytical method was used, entering the scores of *boldness*, *meanness*, and *disinhibition* as predictors, and participants' performance in the TASIT-S as the outcome variable.

All assumptions of linear regressions were previously verified, namely the normality of error distribution (through the normal probability plot), linearity, homoscedasticity, and independence of errors (through the Durbin-Watson statistic). Cases with standardized residuals  $> 3$  were considered outliers, but no such cases were found. In the multiple linear regressions, multicollinearity was also analyzed through VIF value, with a score higher than 10 being considered problematic (Vittinghoff et al., 2011); all VIF values were below 10. Sample size in each model was considered by taking Green's (1991) rule of " $N > 50 + 8 * \text{number of predictors}$ " as reference.

Lastly, Pearson's coefficients were computed to analyze the correlations between the dimensions of the triarchic model of psychopathy, empathy, and the domains of social cognition.



## Results

### 1. Descriptive statistics

Table 1 presents the descriptive statistics of the variables of interest. Regarding TriPM, SRP-SF, QCAE, and MCSDS, means and standard deviations were computed for each of the subscales. Concerning TASIT-S, Table 1 displays the number of correctly identified positive and negative emotions, as well as correctly identified sincere and sarcastic remarks in Part 2 and deceitful and sarcastic remarks in Part 3.

**Table 1**

*Descriptive statistics of study variables*

Variables	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>Possible Max</i>
TriPM	52.52	15.61	21-100	174
Boldness	26.92	7.89	7-41	57
Meanness	9.23	6.38	0-31	57
Disinhibition	16.36	7.77	3-36	60
SRP-SF	48.03	12.87	29-91	140
Interpersonal	13.37	5.10	7-28	35
Affective	11.27	3.65	7-22	35
Lifestyle	14.36	5.43	7-33	35
Antisocial	10.02	2.81	8-30	35
QCAE				
CE	59.81	8.24	28-73	76
AE	34.50	5.83	16-43	44
MCSDS	6.71	2.38	1-11	13
TASIT-S				
Part 1				
Positive	6.67	1.33	4-10	3
Negative	0.97	0.78	0-3	7
Part 2				
Sincere	10.55	3.44	1-16	16
Sarcasm	16.18	2.92	5-20	20
Part 3				
Lies	12.00	2.53	0-16	16
Sarcasm	15.17	2.85	0-20	20

Note. Tri-PM = Triarchic Measure of Psychopathy; SRP-SF = Self-Report Psychopathy Scale – Short; QCAE = Questionnaire of Cognitive and Affective Empathy; MCSDS = Marlowe Crowne Social Desirability Scale (MCSDS), TASIT-S = The Awareness of Social Inference Test – Short; CE = Cognitive Empathy, AE = Affective Empathy

## 2. Confirmatory analyses

### 2.1. Psychopathy and identification of facial expressions of emotion

Table 2 shows the results of the linear regressions made in order to test whether psychopathy, as measured by the SRF-SF, predicts the identification of facial expressions of emotion (H1). The total score of psychopathy measured by SRP-SF did not predict the identification of positive facial expressions, nor negative facial expressions. Overall, psychopathy, as measured with SRP-SF, did not seem to predict the identification of facial expressions.

**Table 2**

*Results of the regressions models and respective coefficients for predicting the identification of facial expressions of emotion from psychopathy*

Outcome variables	<i>F</i>	<i>R</i> <sup>2</sup>	<i>B</i>	$\beta$	<i>p</i>
Correct Positive	1.85	.03	-.01	-.17	.18
Correct Negative	0.62	.01	.00	.10	.43

Note. Correct Positive = correctly identified positive facial expressions; Correct Negative = correctly identified negative facial expressions

### 2.2. Psychopathy and identification of sarcasm in a minimal cues' context

Table 3 shows the results of the linear regressions made in order to test whether psychopathy, as measured by the SRF-SF, predicts the identification of sarcasm (H2). The total score of psychopathy measured by SRP-SF did not predict the identification of sarcastic remarks, neither in minimal cues nor enriched environments.

**Table 3**

*Results of the regressions models and respective coefficients for predicting the identification of sarcasm from psychopathy*

Outcome variables	<i>F</i>	<i>R</i> <sup>2</sup>	<i>B</i>	$\beta$	<i>p</i>
Sarcasm Part 2	0.12	.00	.01	.04	.73
Sarcasm Part 3	0.04	.00	.00	.03	.85

Note. Sarcasm Part 2 = number of correct answers identifying sarcastic remarks in Part 2 of TASIT-S; Sarcasm Part 3 = number of correct answers identifying sarcastic remarks in Part 3 of TASIT-S;

### **2.3. Psychopathy and identification of lies in an enriched context**

Table 4 shows the results of the linear regressions made in order to test whether psychopathy, as measured by the SRF-SF, predicts the identification of lies (H3). The total score of psychopathy measured by SRP-SF did not predict the identification of deceitful remarks, nor truthful ones.

**Table 4**

*Results of the regressions models and respective coefficients for predicting the identification of deceitful remarks from psychopathy*

Outcome variables	<i>F</i>	<i>R</i> <sup>2</sup>	<i>B</i>	$\beta$	<i>p</i>
Sincere	2.46	.04	-.05	-.19	.12
Lie	0.04	.00	.01	.02	.85

Note. Sincere = number of correct answers identifying deceitful remarks; Lie = number of correct answers identifying deceitful remarks.

### **2.4. TriPM dimensions of psychopathy, and identification of facial expressions of emotion, sarcasm, and lies**

Table 5 shows the results of multiple linear regressions made in order to test whether boldness, meanness, and disinhibition, as measured by the TriPM, predict the identification of facial expressions of emotion (H4, H7, and H10). Neither boldness, meanness nor disinhibition seemed to predict a better identification of positive or negative facial expressions. None of the dimensions of psychopathy measured by the TriPM predicts the identification of facial expressions of emotion.

**Table 5**

*Results of the regressions models and respective coefficients for predicting the identification of facial expressions of emotion from psychopathy, measured by TriPM*

Variables	<i>t</i>	<i>p</i>	$\beta$	<i>F</i>	<i>df</i>	<i>p</i>	<i>Adj. R</i> <sup>2</sup>
Correct Positive				0.28	3, 65	.84	-.03
Boldness	0.43	.67	.06				
Meanness	-0.17	.87	-.03				
Disinhibition	-0.59	.56	-.09				
Correct Negative				1.28	3, 65	.29	.01
Boldness	0.92	.36	.12				
Meanness	-0.64	.52	-.10				
Disinhibition	1.70	.09	-.26				

Note. Correct Positive = correctly identified positive facial expressions; Correct Negative = correctly identified negative facial expressions.

Table 6 shows the results of multiple linear regressions made in order to test whether boldness, meanness, and disinhibition, as measured by the TriPM, predict the identification of sarcasm (H5, H8, and H11). None of the dimensions of psychopathy measured by the TriPM predicted the identification of sarcasm, either in minimal cues' or enriched environments.

**Table 6**

*Results of the regressions models and respective coefficients for predicting the identification of sarcasm from psychopathy, measured by TriPM*

Variables	<i>t</i>	<i>p</i>	$\beta$	<i>F</i>	<i>df</i>	<i>p</i>	<i>Adj. R</i> <sup>2</sup>
Sarcasm Part 2				.54	3, 65	.66	-.02
Boldness	-1.03	.31	.12				
Meanness	0.87	.39	-.10				
Disinhibition	-0.71	.48	-.26				
Sarcasm Part 3				.90	3, 65	.45	-.01
Boldness	0.23	.82	.03				
Meanness	0.71	.48	.11				
Disinhibition	-1.59	.12	-.24				

Note. Significant values are depicted in **bold**; Sarcasm Part 2 = number of correct answers identifying sarcastic remarks in Part 2 of TASIT-S; Sarcasm Part 3 = number of correct answers identifying sarcastic remarks in Part 3 of TASIT-S.

Table 7 shows the results of multiple linear regressions made in order to test whether boldness, meanness, and disinhibition, as measured by the TriPM, predict the identification of lies (H6, H9, and H12), as well as sincere remarks. Regarding the latter, boldness seemed to predict a better identification of truthful remarks, while disinhibition seem to predict a worse identification. Regarding deceitful remarks, boldness seems to predict a better identification of lies.

**Table 7**

*Results of the regressions models and respective coefficients for predicting the identification of lies from psychopathy, measured by TriPM*

Variables	<i>t</i>	<i>p</i>	$\beta$	<i>F</i>	<i>df</i>	<i>p</i>	<i>Adj. R</i> <sup>2</sup>
Sincere				4.92	3, 65	.004	.15
Boldness	2.60	<b>.01</b>	.30				
Meanness	0.31	.76	.04				
Disinhibition	-2.50	<b>.02</b>	-.35				
Lie				2.85	3, 65	.04	.08
Boldness	2.75	<b>.01</b>	.33				
Meanness	0.44	.66	.07				
Disinhibition	-0.37	.71	-.05				

Note. Significant values are depicted in **bold** ; Sincere = number of correct responses identifying truthful remarks; Lie = number of correct responses identifying deceitful remarks.

### 3. Additional analyses: relations between psychopathy, empathy, and social cognition

In order to explore the relationships between (a) the dimensions of the triarchic model of psychopathy (boldness, meanness, and disinhibition) assessed by the TriPM, (b) empathy (cognitive and affective) assessed by the QCAE, and (c) the domains of social cognition assessed by the TASIT-S (emotion identification, sarcasm, lying), the correlations between these variables were calculated and are presented in table 6.

Both boldness and disinhibition correlate with the identification of sincere remarks on Part 2 of TASIT-S, as expected from the regression analysis. Again, boldness correlated positively which tells us that the higher the level of boldness, the higher the number of correct identifications of sincere remarks. Disinhibition seemed to work in an opposite way, being negatively correlated with the correct identification of sincere remarks. The identification of deceitful remarks was also positively correlated with boldness. Lastly, when

it comes to empathy, boldness correlated negatively with affective empathy, while meanness correlated negatively with both cognitive and affective empathy. Disinhibition does not seem to significantly correlate with empathy.

**Table 6**

*Correlation between the dimensions of the triarchic model of psychopathy, empathy, and the domains of social cognition using Perason's correlation (r)*

	C_N	C_T	Sincere	Sarcasm Part 2	Lies	Sarcasm Part 3	Boldness	Meanness	Disinhibition	QCAE_Cog	QCAE_Aff
C_P	.08	<b>.66**</b>	.24	-.05	.01	-.05	.05	-.07	-.10	.09	-.04
C_N		<b>.81**</b>	-.14	.04	.05	-.03	.11	.07	.21	.08	.07
Correct_Total			.04	.00	.04	-.05	.11	.01	.10	.11	.03
Sincere				.22	.12	.11	<b>.29*</b>	-.10	<b>-.31*</b>	.20	-.20
Sarcasm Part 2					-.16	.18	-.11	.05	-.04	.10	.24
Lies						-.17	<b>.34**</b>	.10	-.00	-.14	-.16
Sarcasm Part 3							.04	-.02	-.18	.12	.03
Boldness								.19	.05	.12	<b>-.27*</b>
Meanness									<b>.57**</b>	<b>-.50**</b>	<b>-.27*</b>
Disinhibition										-.14	.04
QCAE_Cog											<b>.34**</b>

Note. Significant values are depicted in **bold**. \* if  $p < .05$ , \*\* if  $p < .01$ , \*\*\* if  $p < .001$ ; C\_P = correct positive; C\_N = correct negative; C\_T = correct total; Sincere = correctly identified sincere remarks; Sarcasm Part 2 = correctly identified sarcastic remarks in Part 2 of TASIT-S; Total Part 2 = correctly identified remarks in Part 2 of TASIT-S; Lies = correctly identified deceitful remarks; Sarcasm Part 3 = correctly identified sarcastic remarks in part 3 of TASIT-S; Total Part 3 = correctly identified remarks in Part 3 of TASIT-S; QCAE\_Cog = cognitive empathy score; QCAE\_Aff = affective empathy score

## Discussion

Psychopathy is a construct that has been studied throughout the years and multiple questions are still left unanswered. One of them is related to the ability of individuals with high psychopathy to be functional in society, being social cognition a fundamental aspect of social adaptability (Blair & Zhang, 2020). To further analyze the link psychopathy-social cognition, this study focused on sarcastic, deceitful, and trustful interactions. The interaction between psychopathy, facial expressions of emotion and empathy was also explored, to try to make sense of this relation, studied for years, without consensus.

To this end, a sample of 60 participants (39 women) between the ages of 18 and 38, recruited from the community, answered a sociodemographic questionnaire followed by four self-report scales: Triarchic Measure of Psychopathy (TriPM), Self-Report Psychopathy Scale – Short Form (SRP-SF), Questionnaire of Cognitive and Affective Empathy (QCAE), and Marlowe Crowne Social Desirability Scale (MCSDS). At the end, guided by the researcher, TASIT-S was applied. MCSDS scores were not considered in the analysis since no significant correlations were found between it and dependent variables.

When it comes to psychopathy measured through the SRP-SF no significant results were found neither in identification of facial expression of emotion (H1), sarcasm (H2) or lies (H3). Concerning identification of facial expressions of emotion, our findings corroborate those of Glass and Newman (2006) and go against most of the findings of other authors, including important meta-analysis (e.g., Dawel et al., 2012; Marsh & Blair, 2008). A possible explanation for not having found confirmed deficits in both positive and negative facial expressions of emotion may lie the fact that most deficits are found in individuals with antisocial behaviors (Marsh & Blair, 2008) or callous-unemotional traits (Kosson et al., 2002), who do not seem to be well represented in our sample when we look through the scoring of SRP-SF. It also could be related with the instruments used to measure the identification of emotions. In previous studies, like the ones analyzed by Marsh and Blair (2008), facial expressions were shown via photos instead of videos, which convey more information. The fact that the stimuli were only presented in image, without the context, tone of voice or overall bodily expression of the actors, makes it harder to identify (Adolphs, 2003; Arioli, 2018).

Regarding the identification of sarcasm, there are no studies to compare results with because psychopathy and sarcasm have not been analyzed together before. It was expected to find deficits in identification of sarcastic remarks, based solely on what it takes to identify



them. Indeed, individuals with high levels of psychopathy seem to have more deficits in social interactions (Cleckley, 1941; Hare, 1991) and somewhat on empathy (Ali et al., 2009; Andrew et al., 2008; Dolan & Fullam, 2004; Mahmut et al., 2008;). However, it can be questioned whether these deficits are not found in this sample, as most participants seem to thrive in society, as revealed by sociodemographic variables, which may explain the null findings in this regard.

Lastly, when it comes to the ability to identify lies, our study found no association with, against part of the existing literature. In fact, Boddy (2006) talked about the enhanced ability to detect lies in individuals with higher levels of manipulation, using it as a strategy, enhancing adaptative qualities of psychopathy. However, SRP-SF mostly captures a negative view of psychopathy, picking up what are called negative psychopathy traits (Gordts et al., 2017), therefore those nuanced positive qualities might be lost since the instrument. Contrarily, Klaver and colleagues (2009) found the opposite relation, basing their analysis on psychopathic deficits in the identification of emotions in facial expressions and tone of voice. As said earlier, most of these deficits are found in individuals with high levels of psychopathy, who seem to be underrepresented in community samples, such as the one in this study. So, having low and mid-range psychopathy scores could led to the results reported here. It is also important to keep in mind that the lies present in the videos of TASIT-S are white lies, lies that benefit someone (Erat & Gneezy, 2011). It can be postulated that individuals with higher levels of psychopathy traits related with low levels of empathy and sympathy would have trouble comprehending the need to lie to protect someone from a bad consequence, an altruistic lie if you will.

When analyzing psychopathy through the triarchic lens, focusing on boldness, it did not significantly predict the identification of facial expressions of emotion (H5) and sarcasm (H6). That went against our hypothesis. As boldness includes higher social dominance (Patrick et al., 2009), higher traits of boldness were expected to predict a better understanding of facial expressions and sarcasm, at least in comparison with meanness and disinhibition, but that does not seem to be the case. It was also expected that since these individuals have more data to work with such as tone of voice, context and facial expressions, all important in sarcasm detection (Rockwell, 2001, Bryant & Fox Tree, 2005, Campbell et al., 2012, Joshi et al., 2017), they seem to be able to gather it and come up with a right answer and interpretation of those social situations. Plus, understanding nonliteral language can be equivalent of understanding literal language in a rich enough context (Giora et al., 2000). As previously explained, existing evidence is not consistent when it comes to

identification of facial expressions of emotion in psychopathy. Since facial expressions seem to have a somewhat important role in identifying sarcastic remarks (Rockwell, 2001) the fact that no effects were found for identification of emotions can also partly explain a null result for the expected link boldness-sarcasm.

Conversely, it was observed a significant relation between boldness and the identification of both sincere and deceitful remarks (H6). Individuals with higher levels of boldness seem to have a better understanding of these remarks. That goes along the idea postulated by authors such as Bergmuller and colleagues (2010), that individuals that lie more and use those lies as a cheater strategy have in fact a better understanding of lies. The fact that the sample of this study mostly comprises individuals who seem to be socially successful, a good understanding of both sincere and deceitful interactions is not unexpected (Adolphs, 2000; Hanbury, 2020; Patrick et al., 2009).

Meanness did not significantly predict any measures of social cognition, i.e. does not seem to predict higher difficulties in the identification of facial expressions of emotion (H7), sarcasm (H8) and lies (H9), contrarily to what was hypothesized. Although traits associated with meanness are considered maladaptive (Patrick, 2009), this goes against our findings. Again, it must be noted that median scores of meanness are below 10 in a total of 57. It is possible that meanness in this sample is not high nor variable enough for a significant effect on the TASIT-S, but it is worth mentioning that a significant negative correlation was found between meanness and both cognitive and affective empathy, in line with the literature.

Regarding disinhibition, this dimension only predicts a worst understanding of sincere remarks, having no significant relation with the identification of facial expressions of emotion (H10), sarcasm (H11), and lies (H12). This goes against most of the previous findings, which would predict that traits related to disinhibition would impair social cognition (Krueger et al., 2007; Patrick et al., 2009; Sher & Trull, 1994), since individuals who score high in this trait seem to show more personal distress in social situations (Almeida et al., 2015). Once again, disinhibition scores may not be high nor variable enough to confirm the prediction. Increased difficulty in identifying sincere remarks is in line with descriptions of these individuals as cruel, predatory, and distrustful (Patrick, 2009); they may see the world in a more negative way, always thinking someone is out to get them, the same way they seem to be to other people.

To enable a more comprehensive interpretation of the results, it was also explored how empathy correlates with other measures social cognition and with psychopathy. Based on its importance in social interactions, higher levels of empathy were expected to be

significantly associated with better indices of social cognition. That was not the case. Empathy does not seem to correlate significantly with the identification of facial expressions of emotion, sarcasm, or lies. These results go against previous findings postulating that higher levels of empathy predict a better identification of facial expressions of emotion (Dimberg et al., 2011), but we need to keep in mind that other factors are in play when identifying facial expressions of emotion, such as context (Ekman, 1982) and expression intensity (Blair et al., 1999). These could make emotion recognition easier in TASIT-S, therefore, explaining why no correlation was found. Regarding sarcasm, the results are not surprising since literature have told us that to identify sarcasm you need much more than just empathy (Bryant & Fox Tree, 2005, Campbell et al., 2012, Joshi et al., 2017; Rockwell, 2001). The context and the vocal cues are also fundamental (Bryant & Fox Tree, 2005; Campbell et al., 2012), something that in these videos there is a lot of. Concerning deceitful remarks, it would be expected to find a positive correlation with empathy, but none was found. Lies are as difficult to identify as since remarks are, as there are a lot of verbal and nonverbal cues that can be either related to lying or truth telling (Park et al., 2002; Vrij, 2008). Also, there is evidence that the higher the empathy, the more difficult it becomes to understand lies (Zloteanu et al., 2020). People that see the world in a more empathic way, especially with affective empathy, tend to believe more in deceitful comments, but the results of this study suggest that empathy does not seem to have such an important role in other measures of cognition as was previously postulated (Korman et al., 2015; Malle, 2004). Lastly, both boldness and disinhibition correlated significantly with the identification of sincere remarks. Individuals with higher levels of boldness seem to better understand sincere remarks, while when talking about individuals with higher levels of disinhibition the results seem to be opposite, having these more trouble with sincere remarks identification. This can be explained by the fact that boldness encompasses more adaptive traits which seem to help with overall social interactions (Patrick et al., 2009). Meanness was the only trait that correlated negatively with cognitive and affective empathy. Boldness correlated negatively only with affective empathy, and no significant correlations were found for disinhibition. This shows that individuals with higher levels of meanness have lower levels of empathy, both cognitive and affective, which was expected when taken in consideration the findings of Campos and colleagues (2020). The same holds for boldness and affective empathy. This tells us that, when it comes to analyzing data that comes from individuals with high levels of meanness and, to some extent, boldness, it is important to take into consideration its

association with empathy, which can mediate the relation of the former with other measures of social cognition.

This study has some limitations that should be noted. The sample size, although common in this field, was small for ensuring a sufficiently powered analysis. Besides, high levels of psychopathy traits may be underrepresented in this community sample. Most of the participants have above-average formal education and jobs, making it harder to get to the nooks and crannies of psychopathy, especially in its relation to antisocial behaviors. If indeed there are individuals with high levels of psychopathy in the sample, they are most probably characterized by its adaptative facets, such as boldness. This could also explain why there are no significant results regarding meanness and disinhibition: the scores may be too low in terms of maladaptive traits for us to find results. Future studies should continue to focus on community samples, so the adaptative facet of psychopathy can be duly considered, but it is important to reach individuals who are less in sync with society values and have trouble fitting in, including forensic samples. This way it be possible to actually understand how each of the psychopathy facets interact in terms of predicting social cognition. It would also be important to broaden the sample in schooling and age, while keeping it between 18 and 50. Most of the participants in this study, as it is common practice in similar studies, are young adults and university students; having a more balanced sample regarding these demographic variables could strengthen the findings.

Despite the abovementioned limitations, the present study also has positive aspects. Firstly, measures of social cognition are closer to real life interactions by using videos. This way, more social cues are available, such as tone of voice, body expression, and demeanor, enabling to correctly interpret what is happening more easily. In terms of measuring psychopathy, two instruments were used, one more based on the 2-factor model and based on maladaptive behaviors: the other based on the triarchic model and emphasizing the adaptative side of psychopathy, thus allowing a more accurate analysis of the construct. The role of empathy, both cognitive and affective, was took into consideration, and it was screened out the eventual influence of social desirability on the results of TASIT-S. Lastly, this study sheds light on how psychopathy relates with deception, sincerity, and sarcasm. To the best of our knowledge, this is the first study attempting to do that.

## **Conclusion**

This study suggests that psychopathy, at least in the recruited sample, does not seem to have a significant influence on the aspects of social cognition that were under analysis here, namely in identifying facial expressions of emotion, sarcasm, lies, and sincere exchanges. However, when analyzing the more adaptative traits present in boldness its role in identifying lies and sincere exchanges, especially in cues enriched environments, is revealed. Regarding disinhibition, this dimension only predicts a worst understanding of sincere remarks, explained by the fact that individuals with high levels of disinhibition see the world in a more negative way, always thinking someone is out to get them, having more difficulties in trusting other people. These findings support the view that psychopathy must be considered in its distinct phenotypes, including adaptive ones, and that the construct is in fact dimensional, not categorial. The results of this study also suggest that there is no significant relationship between empathy and the components of social cognition measured in TASIT-S. These findings have practice implications for further research. They do not question the importance of empathy in social cognition, but rather suggest that there are components present in the videos of TASIT-S, such as tone of voice, outside information about the interaction, and overall bodily expression, that can have a bigger role in social cognition than previously thought. When examining the relationship between psychopathy and empathy, results support a negative correlation between both cognitive and affective empathy with meanness, as well as between affective empathy and boldness. That goes along with findings recently reported in the literature, but more studies are needed to clarify the relation between the two constructs.

Summing-up, the relation between psychopathy and social cognition, especially sarcasm and lies, remains open and more studies with improved ecological validity should be developed to try to make sense on how individuals with high levels of psychopathy navigate social interactions.

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