universität wien

MASTERARBEIT / MASTER'S THESIS

Titel der Masterarbeit / Title of the Master's Thesis

Is the Matrix Task a Reliable Lying Paradigm?

An Investigation Focusing on the Role of Narcissism and Susceptibility to Social Influence

verfasst von / submitted by

Dorottya Georgina Csorba, BA, BSc

angestrebter akademischer Grad / in partial fulfilment of the requirements for the degree of

Master of Science (MSc)

Wien, 2022/ Vienna 2022

Studienkennzahl lt. Studienblatt / degree programme code as it appears on the student record sheet:	UA 066 840
Studienrichtung lt. Studienblatt / degree programme as it appears on the student record sheet:	Masterstudium Psychologie UG2002
Betreut von / Supervisor:	Assoz.-Prof. Giorgia Silani, Privatdoz. PhD

Table of Contents

Acknowledgments

This thesis would not have been possible without the support of many people. Many thanks to my supervisor, Assoc.-Prof. Giorgia Silani, Adj.Professor. Ph.D., who helped me with this project and answered my numerous questions patiently.

Thanks to the University of Vienna for providing me with a research grant with the financial means to conduct this study. And finally, thanks to my father and friends for their support and love.

Theoretical Background

Exploring the nature of lying - and dishonest behavior - has long been a field of interest in research to focus on. Although Sporer (2004) argues for an integrated cognitive model of deceptive behavior*,* the term *lying* shows a wide range of types and its unique characteristics: from impulsive lies to yes-no questions created on the spot to detailed deliberately invented alternative scenarios. The terms *lying* and *deceit* will be used in this thesis interchangeably.

The spectrum of dishonest behavior encompasses episodic lying, that is people who only occasionally respond deceptively, those who make a false statement or invent something to compensate memory lacks, cheaters acting for a specific incentive, with the end of seriousness ranking up to both the frequent deceptive responders and the ones with pathological deceptive behavior (Verschuere et al. 2016; Muzinic, 2016).

The literature regarding the topic comprises the ones differentiating between compulsive and “normal” (common)lying, their biological and social characteristics, as well as their possible existent driving forces, such as its contextualities and comorbidities. The verbal, paraverbal, (hand) written or typed as well as other non-verbal forms of lies differ in terms of behavioral cues of deceit on various modalities reflecting in body, face, voice and text.

Yet, because of its diverse forms as well as numerous interlaying factors, there are still controversies to be found and questions to be asked. Detecting deception and assessing lies with various paradigms and methods as well as their characteristic differences as regards to situational and personal factors are not only important in forensic aspects but also in everyday-life, and, consequently, in research.

Compulsive and Common Lying

Pathological lying, which tends to be described with various terms such as *pseudologia fantastica*, *mythomania* or compulsive lying, shows a pattern of repetitiveness and a high frequency of lies (Dike, 2008). A clear motivation or an external comprehensible reason behind these lies are lacking, therefore, the exact circumstances are often undetectable. During the occurrence of pathological lying the liar experiences a reduced ability to control his/her lies and - due to its compulsive and impulsive nature - is unable to put an end to it (Muzinic et al., 2016). Pathological liars often suffer from low self-esteem and, therefore, experience failure to meet the expectations of their environment, which often results in developing a false-self (Harter & Leahy, 2001).

“Normal” lying, on the contrary, is described as “making a false statement with the intention to deceive” (Simpson & Weiner, 1989) and is, in contrast to pathological lying, characterized by a clear motivation (interest and/or gain). Possible reasons for dishonesty in these cases are to reduce stressful situations, avoid embarrassment, fulfill personal gains or manipulate.

In the next segments/chapters, lying would refer to the “normal” form of deception.

Detecting lying and its Characteristics

When it comes to deception and its analysis, it tends to divide into separate types according to the context given. A great part of their importance lies in the detection of the emergence in forensics or everyday life and its characteristics.
One of the detecting tools are polygraphs, measuring arousal of the subjects when answering certain questions which are still frequently used in the United States, e.g.

during police investigations. However, false-positive and false-negative results occur from time to time due to the arising anxiety experienced in subjects caused by the test itself. (Vrij et al., 2006).

Research suggests (Vrij et al., 2006; Blandón-Gitlin et al., 2014) that lying requires more intellectual effort than telling the truth in general, since creating an alternative truth with its details comes with an increased cognitive load, and consequently, requires a greater deal of concentration leading to longer response times (RT) to questions than telling the truth. Most methods in forensics, such as the so-called *Cognitive Load Approaches* (*CLA*s) of lying identification, target exactly these findings in order to overload one's cognitive capacity (Blandón-Gitlin et al., 2014) by using repeated-interview measurements in investigations, instructing offenders to tell the events in a chronologically reverse order or while conducting tasks simultaneously (Vrij & Granhag, 2012). Also, unexpected surprising questions that suspects cannot foretell are not uncommon.

Nonetheless, these findings have been derived from the basic knowledge that new situations require more components to be aware of. Pathological liars, however, have been used to lying, and because of the practice, they may prepare lies faster by showing briefer RTs (Bockstaele,2012). Similarly, the deceivers who have been rehearsing their lies could produce shorter RTs, which would make the previous findings applicable only in general.

Indicators of Deceit in Verbal and Nonverbal Context

Deception has been associated with arousal and some specific negatively (such as fear and guilt) and positively (excitement, pleasure) valenced emotions, elicited by the deception process itself (Ekman, 1992). The *Facial Action Coding System* (*FACS*), (Ekman & Friesen, 1978, updated in 2002) is a widely used system

with good to excellent reliability (Sayette et al., 2001), describing anatomically detailed facial activities, allowing to categorize facial appearances and code them in specific *action units* (*AU*s) generating temporal profiles of the movements with a computerized tool. The *AU*s aim to describe muscle activation in specific facial expressions. *EMFACS* (*Emotional Facial Action Coding System*; Ekman, 1990) specifies *AU*s in connection with the expression of certain basic emotions like sadness, disgust, fear, surprise, happiness and anger. By using this system, truthful emotions can be differentiated from feigned ones. For instance, in a so-called *Duchenne smile* the *zygomatic major* and inferior part of *orbicularis oculi* contract on the muscular level, showing a complex appearance of a smile, including the engagement of the muscles in the eyelids, suggesting sincere and involuntary movements, whereas only the *zygomatic major* contracts during the insincere and voluntary *Pan-Am smile* (Del Giudice & Colle, 2007). Similarly, narrowing the lips has been identified as a consequence of involuntary anger, which is usually not manifested in the case of feigned anger (Ekman, 1988), since most people are not able to voluntarily produce that movement, nor are they aware of its necessity.

Other observation methods led to the identification of specificities in appearance during and after decisive behavior, revealing that these differ individually. There are no explicit behavioral signs of deceit and no universal guide for recognizing every liar (Ekman, 1988). How often a person usually engages in lying could have a considerable deal of influence on verbal and nonverbal cues shown, while telling untruthful statements (Van Bockstaele et al., 2012), which could be a possible explanation for controversial findings in the literature. Over the years, it has become a popular belief that lying is associated with gaze aversion (A World of Lies, 2006), which has been refuted in newer studies (Matsumoto et al., 2011; Vrij et

al., 2001; DePaulo et al., 2003). Biland (2004), after having summarized the results of more than 60 studies regarding nonverbal and paraverbal and accompanying behavioral cues, claims that there might be no valid unambiguous indicators of decisive behavior in terms of outer appearance.

However, there are certain recurring patterns. Assumingly because of the cognitive overload, (Vrij et al., 2006) speech hesitations (Vrij et al., 2001; Ekman, 1988), decreased non-verbal activity (especially movements of hands and legs, Vrij et al., 2006; Zuckerman et al., 1981,), but also a decrease in eye blinks during telling lies and an increase afterward (Leal & Vrij, 2008) have been identified. Apart from that, Vrij (2000) - after having reviewed more than 40 studies on the outer appearance of deception- adds to the list increased pitches in voice (also in Ekman, 1988), and possible speech errors like repetitions and stutter (Ekman, 1992).

The possibility of detection of lying by medical imaging (fMRI) has been recently discussed, as an increased activity in the *ventrolateral prefrontal cortex* (*VLPRC*) has been found. Furthermore, neuroimaging studies revealed that there is a significantly greater activation of the *articulate cingulate cortex*, associated with executive control processes (e.g., inhibition, attention, working memory) during telling lies (Christ et al., 2008). Speer and colleagues (2020) have recently broadened these discoveries suggesting that the activity and areas involved depend on how often people behave (dis)honestly, arguing that the later mentioned areas promote honesty in subjects with a usually dishonest mindset, while they simultaneously enable dishonesty in usually honest individuals. Also, the *nucleus accumbens* gets activated during cheating in usually dishonest subjects, while the *posterior temporoparietal junction cingulate cortex* and *medial prefrontal cortex* assist for honesty in subjects with a usually honest mindset.

Assessing Lies in Research

Apart from detecting lying behavior, research also investigates specifics of dishonest behavior in labor-field. A great part of literature about dishonest behavior gained its knowledge via self-reports, e.g. Lie Acceptability Scale (Oliveira & Levine, 2008); Lie-Truth Ability Assessment Scale (Zvi & Elaad, 2018); Lying Profile Questionnaire (Makowski et al., 2021), diverse survey-vignette methods about one's cheating behavior (O´Rourke et al., 2010; Rettinger & Kramer, 2008) or the Propensity to Lie Questionnaire (PTLQ, Azizli et al., 2016), which operates with direct questions regarding lies, for instance, with items such as "How often do you lie?" or by displaying diverse scenarios with possible answer possibilities in terms of engagement.

Another method of research embraces lying behavior more like a "not truth-telling paradigm", giving lies upon specific instructions within laboratory fields. The so-called Sheffield Lie test (Suchotzki et al., 2018) offers yes/no response alternatives (e.g. "Is London in Germany?"), where participants are selected either to truth-telling or to lie-telling groups/trials where then some cues related to response times and differences are measured.

Nonetheless, these methods cannot assess lying and cheating in real-time as they occur in reality. Few studies have introduced and implied other on-site procedures for measuring dishonesty in connection with a specific (mostly monetary) reward. These include tasks where participants are presented with a long list of items and instructed to choose one whereafter they have to say whether it was displayed afterward, in which case a yes response is bound to a lie, (Albertazzi, 2021) or a difference spotting task with the possibility of claiming to have found more differences between stimuli than it was actually to found (Liu et al., 2021) and last

but not least, there are other measurements such as specific experimental paradigms.

Emergence of Lies in (Strategic) Games

Additionally, another tool has been introduced for measuring dishonest behavior elicited spontaneously with the intent of gaining a certain reward, containing several experimental paradigms, including strategic games and tasks, among which there are four which are well established and widely used paradigms for assessing cheating with replications (Verschuere et al., 2018) and come into application the most frequently: sender-receiver game, coin-flip task, rolling dice and matrix task (Gerlach et al.,2019). These possibly induce a mind switch in participants, causing them to take financial aspects, including cost–benefit analysis into consideration and hereby get distracted from moral reasoning (Bazerman & Tenbrunsel, 2012).

In the coin-flip - or roll dice task - the associated gain is determined by chance and subjects decide to report their results falsely or truthfully afterward. During the sender-receiver game on the other hand, one of two players, the sender gets information about two options from which the other (hypothetical) player has to choose. The sender has the chance to brief the receiver falsely, leading him/her toward an option that is more beneficial for the sender him/herself, or to educate the receiver truthfully. The receiver decides according to the information stated by the sender previously.

The matrix task is a real-effort task where subjects are presented to 20 matrices, each consisting of 12 three-digit numbers (e.g., 4.56), alongside the instruction to find the number pair in each matrix that adds up to exactly 10.00, e.g. (5.19 + 4.81), under time pressure (between 2.5 and 10, but mostly 5 minutes). Participants get paid according to their reported solved matrices, varying between

$0.16 and $10/pair. The exact implications of these paradigms differ in research, with manipulations from monitoring, across reward sizes to groups, or testing from direct or indirect physical distance.

There are two ways of assessing cheating in these paradigms: in the aggregated form the design consists of an experimental group and a control group from which the results (and so the possible lies) are derived. In studies using this design, the experimental condition usually includes destroying the worksheets. Another way is to insert an individual identification code or a collection slip in order to be able to recognize the subjects having shown dishonest behavior.

Notably, the willingness to engage in lying differs across the four paradigms, possibly due to activating different levels of dishonesty, lying about chances in a randomly generated series of events, about own performance, or misleading a person for self-interests. In die-roll tasks, liars cheat to a greater extent than in the matrix task (Gerlach et al., 2019), which could be because chances are better there than the chance of showing a perfect performance. Another explanation could be the assumption that -while the latter is randomness- the former is ability-based, which leads to rewards feeling more deserved.

Lying Behavior and Personal Factors

Research suggests that personal factors also play a huge role when it comes to lying. According to a meta-analysis (Lee et al., 2020) some personality traits, such as conscientiousness ($p = -.25$), sense of morality ($p = -.24$) and agreeableness ($p = -.13$) have been associated to correlate negatively with the tendency for deception in academic context, while the presence of others such as impulsivity ($p = .39$) and academic self-efficacy ($p = .28$) have been considered to promote cheating behavior. Corcoran and Hankey, (1989) suggest being a heavy drinker also is a promoting

factor, while David (2015) argues that an optimistic human view goes along with decreased cheating behavior.

Another meta-analysis in the topic (Gerlach et al., 2019) implies age being a differentiating factor too, displaying a sinking engagement in deception by aging. Possible explanations for the recurring effect are a decline in personality traits in association with lying behavior, such as extraversion and increasing conscientiousness among adults (Milojev & Sibley, 2017). Older adults rated higher on self-reported honesty–humility scale (O'Connor et al., 2021), and are also probably more willing to preserve their positive self-image, or they keep a narrower gap between their actual and ideal self in mind, so that they do not feel the need to compensate. Also, in line with this, young adults report higher scores in narcissism and lower in social confidence (Ashton & Lee, 2016). However, this was not confirmed in matrix tasks unlike in other paradigms, according to an extensive meta-analysis (Gerlach et al., 2019).

There has been an ongoing debate regarding the possible role of gender with mixed results, some state no differences (Childs, 2012; Gylfason et al., 2013), one suggesting that the females tend to have a greater part in the engagement of dishonest behavior (Ruffle & Tobol, 2014), while the majority have argued for clear differences, implying that males are more prone to dishonesty, especially in sender-receiver games (Dreber & Johannesson, 2008; Cappellen et al., 2013; Houser et al., 2012, Friesen & Gangadharan, 2012), presumably partly due to differences in risk-taking behavior (Gerlach et al., 2019; Abeler et al., 2016). The two recent meta-analyses (Gerlach et al., 2019; Capraro, 2018) strengthen the results of the majority and also claim that certain differences lay in the form of lies and their consequences: males are more likely to tell “black lies” compared to females,

benefiting themselves at a cost for the other person, as well as “altruistic white lies”, making a profit for the other person at a cost for themselves, whereas there seems to be no significant difference between genders after controlling for education and age regarding “Pareto white lies”, benefiting both the liar and another party.

(Low) Self-esteem as a Factor in Dishonest Behavior

As stated previously, low self-esteem is also regarded as an important factor in the occurrence of compulsive lying. Research suggests, furthermore, it plays a significant aspect in the emergence of dishonest behavior as in common lying. The association between the two is not new: Lobel and Levanon stated back in 1988 that children who had low self-esteem cheated more in a drawing task than those with high self-esteem. Moreover, they argued for a differentiation between true and defensive high self-esteem, where the latter was being characterized by a high need for approval. Self-esteem was found to be correlated negatively with cheating in new studies also (David, 2015; Błachnio & Weremko, 2012), as well as with self-serving and altruistic lies, but not vindictive lies, causing harm (Hart et al., 2020). Farias and Pilati (2021) claim also a positive relationship between self-esteem and susceptibility to disregard descriptive norms. In another paper (Niiya et al., 2008) a similar construct to self-esteem “self-contingencies” has been discussed, showing that men with perceived self-worth in competition and performance-avoidance goals were more likely to cheat than those, who were more virtue-oriented. Surprisingly, this effect was only detectable among men.

Various studies showed that not only primary low self-esteem, but also induced one has an effect on dishonest behavior. Participants after having received negative feedback on a personality questionnaire cheated at least once and significantly more than those who were presented to positive responses (Aronson &

Mettee, 1968). In another study, subjects with induced low self-esteem were more apt to cheat in a test than individuals with induced high self-esteem (Williamson & Assadi, 2005).

Deceit and Narcissism

In terms of psychological disorders deceit is also characteristic in borderline and histrionic personality disorders (Muzinic et al., 2016), as well as within the Dark Triad traits (psychopathy, Machiavellianism and narcissism) (Jonason et al., 2014; Azizli et al., 2016).

Among the Dark Triad, psychopathy was found to play a role in predicting misconduct (Jonason et al., 2014), engaging in pathological lies without specific reason (Azizli et al., 2016), high-risk cheating (Nathanson et al., 2006; Jones & Paulhus, 2017) and is generally claimed to be linked ($p = .40$) with lying behavior (Lee et al.,2020; Muzinic et al., 2016), whereas Machiavellianism has been associated with telling white lies and high-stake lies leading either to significant loss or gain.

As for narcissism, the term alone is not unified, revealing the grandiose and vulnerable form. While the former is defined by vanity, sense of grandiosity and entitlement (Raskin & Terry, 1988), as well as high self-confidence and self-esteem completed with interpersonal exploitativeness, demanding admiration and attention, the latter exhibits insecurities and timidity alongside low self-esteem, and also showing comorbidity with avoidant personality disorder and depression (Dickinson & Pincus, 2003; Rose, 2002). The two forms possibly build separate constructs (Lapsley & Aalsma, 2006), forming joint attributes only in “cognitive-affective preoccupation with the self and a tendency to give into one’s own needs, disregard for others” (O'Reilly & Doerr, 2020) and cold interpersonal behavior (Miller et al,

2012). Since the exact characteristics of the newly discovered vulnerable form are still under discussion and most findings and measurement tools relate to the former, this thesis focuses on grandiose narcissism. Consequently, this form is denoted by narcissism in the following chapters.

Apart from positive correlations with life satisfaction, extraversion and openness (Wonneberg, 2007), grandiose narcissism has been linked to using others for self-interests, by exhibiting dominant and risk-taking behavior as well as impulsivity, Cluster B personality disorder traits, and aggression (O'Reilly & Doerr, 2020; Miller et al., 2012). Taken the above into account and that narcissists are less likely to feel guilt (Schröder-Abé & Fatfouta, 2019), have a higher need for control (Oliveira & Levine, 2008), display empathy-deficits (American Psychiatric Association, 2013) and score lower with respect to agreeableness (Wonneberg, 2007). Therefore, it is not surprising that narcissism correlated positively with greater acceptance for lies (Oliveira & Levine, 2008). A potential reason for that may be that the perceived power of leading people astray would outweigh moral considerations. Narcissism has been also associated with increased willingness to deceive for self-gain purposes (Azizli et al., 2016; Zvi & Elaad, 2018), showing a diversity of falsehood practiced, among which self-deception also takes its role (Wonneberg, 2007) by exhibiting high self-deceptive enhancement like overconfidence and exaggeration, even to an extent to claim deep knowledge in non-existent fields (Jones & Paulhus, 2017). People with narcissistic personalities are more likely to cheat in academic context (Esteves et al., 2020) and in the labor market by altering their CVs or bringing others to do that (Zvi & Shtudiner, 2021). Additionally, they are prompt to overrate their abilities, when it comes to unveiling lies (Zvi & Elaad, 2018).

Being occupied with self-aggrandizement, narcissists engage in deceptive like-seeking behavior, pursuing popularity (Dumas et al., 2017). In a study Zvi and Elaad (2018) investigated differences within narcissism subscales of the Narcissistic Personality Inventory (NPI) as regards to their relation to the diversity of deceit, all of which showed a positive association with telling frequent lies, whereas there was no evidence for a connection regarding altruistic deception. Furthermore, Leadership/Authority, Entitlement/Exploitativeness and Exhibitionism facets of narcissism correlated with deception without a reason, whereas Grandiose Exhibitionism, Entitlement/Exploitativeness, Sufficiency and Vanity were linked with lying for purposes of self-gain. Moreover, Exhibitionism, Exploitativeness, Vanity and Sufficiency subscales had been linked to deceive a greater number of people. Lying ability was also positively associated with the Manipulativeness facet of narcissism (Makowski et al., 2021). There is, however, little evidence that the effect of narcissism on dishonest behavior would vanish after controlling for the Dark Triad traits (Williams et al.,2010).

Narcissism and Lying for a Reward. The research discussed in the previous section embraced lying and cheating based on self-report measurements or studies without an actual monetary gain to lie for. These are slightly different from the type of lies where through altering the truth one can gain financially, which can be possibly regarded as a step-up towards the category of stealing, where not only the judgment is greater to face with, but also the reward itself. Analyzing this change of condition, research suggests a definite role of the Dark Triad in a low-risk coin-flip task, yet, only psychopathy has been linked to the high-risk condition, where there was a significant chance to get caught. By contrast, only psychopathy and Machiavellianism had an effect on fraud (Jones & Paulhus, 2017). Narcissists tended

to cheat more in a rolling dice task and also were more likely to steal (O'Reilly & Doerr 2020). There are, however, mixed results regarding the engagement of narcissists in matrix tasks. While Nicholls and colleagues (2019) argue for an increased willingness to lie, claimingly caused by a sense of entitlement, Roeser et al., (2016) failed to find the same effect by relating the cheating behavior to psychopathy.

Lying Behavior and Social- and Situative Aspects

Apart from personal effects, situative factors and more narrowly, social components tend to have an interplay in the emergence of lying - and cheating - behavior.

Whether dishonesty or honesty comes intuitively, has been unclear and long undetectable, causing mixed results promoting either the first or the latter. A meta-analysis (Köbis et al., 2019) found evidence of a moderating factor: intuitive (dis)honesty is moderated by the art of the victim, so that in the case of an abstract victim or an unidentifiable loss, participants would tend to be dishonest, whereas in the case of concrete victims, they would rather react honestly. Also, establishing a social norm where cheating “happens” or is accepted increases cheating behavior, especially, if the loss is not clearly identifiable.

There is strong evidence that others' cheating behavior has a crucial impact on one's own attitude and action within this context. One of the most crucial reasoning goes back to the rational crime theory (Allingham & Sandmo, 1972) which describes an inner estimation of the likelihood of getting caught in the act by analyzing the social environment. A review (McCabe et al., 2001) about cheating in academic institutions argues that perceptions of others' behavior is the “most powerful influence”. The impact of social learning by observing others was already

shown by Bandura (1961), where witnessing someone being aggressive also led to aggression among children. This realization, alongside with the social identity theory imply (Tajfel, 1982) that individuals would be more prone to imitate others´ behavior, in case this person is identified as a member of one's own group, activating the perception of social norms in that particular situative context. In an experiment by Daumiller & Janke (2019), where participants completed a (knowledge)test, social norms showed a moderating effect regarding the acceptance and neutralization of dishonesty, so that subjects who have been experiencing a cheating confederate /vs. no observable cheating behavior, were more likely to cheat themselves. This finding is also supported by Rettinger & Kramer (2008) and Jordan (2001), claiming that cheaters witnessed more cheating themselves in the past than non-cheaters did. Also, a strong association between self-reported behavior and known cheating of others has been found by O´Rourke and colleagues (2010), considered to be also the best predictor, especially, if it comes with an inner acceptance of cheating. Moreover, researchers argue that the influence of others' behavior could possibly outweigh personal attitudes, since the latter possesses only a small effect on its own. In the same way, an opposing attitude by the group results in decreased likelihood of cheating (McCabe, 1993).

The social environment, therefore, tends to have an influence on the emergence of cheating behavior and dishonesty. On the other hand, excessive saliency of an immoral act has been found to possibly change the focus of the observer to an inner evaluation of the act, leading to act morally after all (Gino et al., 2009). Also, reminders of ethical norms have been suggested to show a preventive function (Gerlach et al., 2019). These situative factors, among the length of physical

distance and the amount of reward size, are thought to have a moderating effect in terms of dishonest behavior.

Previous Findings in the Matrix Paradigm

In terms of the matrix task findings implicate that in contrast to sender-receiver games, very few people cheat to the maximum extent (Mazar et al., 2008; Békir et al. 2015; Gerlach et al., 2019), a possible explanation could be self-concept maintenance (Mazar et al., 2008; Fischbacher & Föllmi-Heusi, 2013) leading people to make a profit, but without needing to change their inner self-image. In contrast to sender–receiver games and coin-flip tasks, in the die-roll paradigm or matrix task, greater payoff has not increased cheating behavior, but abstract gain (tokens) did (Mazar). In this connection, Speer and colleagues (2020) suggest a differentiation between usually honest or dishonest individuals, claiming that subjects belonging to the first category would rather get held back as the payoff increases, causing them to engage in moral reasoning, while cheaters could get more motivated to behave dishonestly.

Some studies suggest, in accordance with general findings, that specific facets of morality make a difference in provoking or decreasing misreports. Mazar and colleagues (2008) argue for the role of moral priming, claiming reading The Ten Commandments prior to completing the task prevents cheating even among atheists. Another study (Békir et al., 2015) writes about morality sanctions having a reducing effect, while Seçilmiş (2017) revealed that people pursue balance so that a recall of a moral action provokes immorality in the matrix task afterwards, as vice versa, an immoral action in the immediate past leads to act more honestly and hence equalizing it. Additionally, cheating inhibits accessing moral information having memorized previously: cheaters were more prone to forget moral rules having read

previously, but only after acting dishonestly, while they were equally able to recall information about another topic like non-cheaters, - an effect that stayed intact even after a promise of a monetary gain for recalling correctly. Schild and colleagues (2019) reviewed the influential factor of the three REVISE principles and found no evidence that ethical priming reduces dishonesty, however, SElf-engagement in a form of retyping an honesty statement shall have a reducing effect. One of the most consistent findings is that strict monitoring decreases the engagement in cheating behavior (Grolleau et al.,2016; Békir et al., 2015), however, moderate monetary and monitoring sanctions are found to have even an increasing effect in a study (Békir et al., 2015). Factors that are believed to positively contribute to cheating in the matrix task are shared rewards (Wiltermuth, 2011), competition (Rigdon & D'Esterre, 2017) darkness providing "illusory anonymity" (Zhong et al., 2010), time (Campos et al., 2022) favoring 5 minutes, environment (private cubicles vs public), love of money (Chen et al., 2014), preventing negative social status (Pettit et al., 2016) or feeling of losing money instead of gaining (Grolleau et al., 2016), engagement in episodic future thinking with a focus on the ideal self (Wu et al., 2017), exhaustion and depleted self-control (Mead et al., 2009), political references (Klimm, 2019). Mixed results dominate the field of gender differences also in the matrix paradigm similarly to the broad literature of dishonest behavior, some arguing for an effect in favor of greater cheating behavior among males (Isakov & Tripathy, 2017; Grolleau et al., 2016), and even for genuinely better performance in the task (Shu & Gino, 2012), while others do not (Seçilmiş, 2017; Rigdon & D'Esterre, 2012; O'Connor et al., 2021).

At last previous findings regarding social influence seemed to have an effect in the matrix task as well. Some studies experimented also here with a cheating

confederate actor (playing another participant) in the room (Mazar et al., 2008; Daumiller & Janke, 2019) whose influence increased others´ cheating behavior.

The Present Study

Current scientific findings have been reviewed concerning the broad topic of dishonest behavior in the previous chapters. The first section dealt with the differentiation between pathological lying and common lying, followed by detection methods and verbal and non-verbal characteristics and assessment measurements, moving on to personal specifics highlighting the role of self-esteem and narcissistic tendencies, ending with situational factors, (more narrowly, perceived cheating behavior of others), and finally a summary of the findings of the above with respect to one specific experimental paradigm, the matrix task.

Various studies have been investigating the nature of lying, having postulated different aspects of its emergence, forms and possibilities for assessment. The literature embraces studies where subjects were made to express untrue statements, where they decided to do so in the hope of winning in (strategic) games or taking a closer look at personality traits and situational cues leading to lies (for references see above). However, most of them focused on either using an experimental paradigm in its diverse manipulation possibilities or applying self-report measurements, inquiring about personality aspects. Nonetheless, the heterogeneous findings across experimental paradigms lead to the conclusion that lying behavior is moderated by a broader range of contextual and personal variables. Among the four experimental paradigms, only the sender-receiver and the matrix task enable an analysis on an individual instead of an aggregate level. In the former, lying tends to be partially ambiguous: whether the reason behind not telling a lie comes from an

emotional barrier or moral reasoning, or rather a strategic move, is not detectable. Because of these considerations the present work focuses on the matrix paradigm.

Several publications have shown evidence of social influence on one's behavior in diverse situations, among others its impact on dishonest behavior, not only in an academic context but also in the matrix paradigm. However, to my knowledge, no studies investigated the relationship between one's susceptibility to social influence and its possible moderating effect on cheating behavior in an induced low self-esteem experimental setting including a cheating confederate.

Susceptibility to social influence could vary among subjects, which might partially explain why some do not cheat, if they are aware of others cheating behavior or observe it directly, even if the environment supports cheating and negative consequences do not follow. Similarly, although narcissism was linked to cheating and lying behavior numerous times in the past, only a few studies investigated narcissism in experimental paradigms, and even less in matrix tasks, in particular.

The present work intends to combine the above, trying to give a more holistic view of engagement in cheating, by aiming to answer the research question “How susceptibility to social influence and narcissism alter cheating behavior?”. In doing so, cheating behavior will be measured with a classical matrix task including a cheating confederate in an induced low self-esteem experimental condition.

Hypotheses

H1. A higher rate of performance will be self-reported in the induced low self-esteem condition compared to the control condition

H2. A higher score in susceptibility to social influence predicts a greater difference between the self-reported performance compared to the actual performance

H3. A higher score in narcissism predicts a greater difference between the self-reported performance compared to the actual performance

H4. There will be no significant differences between the two groups regarding the actual performance

Methods

Overview

The current study, a randomized between-subject design, consisting of two (control and experimental) groups, was carried out in person, in a group setting, with the assistance of a professional actor in the experimental condition. The external variables such as the outer appearance of the experimenter, her verbal and written expressions, the laboratory room and the meeting place were kept constant.

Participants

In accordance with previous measurements of sample size determination (calculated by G*power, Faul et al., 2009) including possible dropouts, 120 subjects were recruited to participate in the study in exchange for a monetary reward of a maximum €15. The recruiting process included targeting possible future subjects via

the internet, posting in various local Facebook groups, as well as in the form of printed media, using flyers.

Participants ranged from 18 to 65 years old (M = 27.56, SD = 9.03). Table 1 shows other sociodemographic characteristics of subjects. Eligible participants were required to be 18 or older, without current or past diagnosis of psychosis, and able to complete the questionnaires in German language. Due to the special characteristics of the experiment, subjects needed to be on-site, filling out the surveys manually. Consequently, a residence in either Vienna or in its agglomeration was needed. The sociodemographic measurement included information regarding 1) age, 2) gender, 3) current employment status, 4)income, 5) marital status; 6) educational status, 7) attended University, 8) field of study, 9) current psychiatric disorders and lastly, 10) level of German language.

Table 1

Sociodemographic Characteristics of Participants

Variable	Category	N	%
Gender	Male	39	32.5
	Female	81	67.5
Education	Elementary school	7	5.8
	High School graduate	39	32.5
	College, no degree	37	30.8
	Bachelor´s degree	22	18.3
	Master´s degree	14	11.7
	Doctorate degree	1	.8
Total		120	

Variable	Category	N	%
Employment status	Unemployment	11	9.2
	Student	54	45.0
	Parttime	31	25.8
	Fulltime	20	16.7
	Pension	2	1.7
	Freelance	2	1.7
German language skills	Intermediate	20	16.6
Total		120	

Measurements

A great part of the study was based on self-reports, except to check the actual performance on the matrix task at the end. The measures were presented in paper-pencil form, and - in accordance with the official language in Austria - in German, either in an already existing version, or via reverse translation, conducted by the experimenter and a professional translator from English to German and back to English independently, for checking possible differences in comprehension between the two languages. Regarding validity and reliability, all the test

measurements have provided good fitness criteria for the study, and are considered acceptable. The scales used will be presented in the following section.

Grandiose Narcissism Scale (GNS). The Grandiose Narcissism Scale (Foster et al., 2015), is a self-report measurement tool, containing 33 items and seven subscales, assessing the grandiose form of narcissism. The six-point Likert scale offers answer options from 1 (strongly disagree) to 6 (strongly agree). The GNS measures narcissism both as a whole and, additionally, in its specific aspects. Hence, it can be analyzed separately by subscales or by adding the scores together, making a total sum of the scores. The presentation order is not fixed and could be done in any order.

The validation of the questionnaire (Foster et al., 2015) was carried out by analyzing the full-scale score of a sample of 980 undergraduate students (39% male, 64% white, Mean age = 20.32), scoring M = 114.66, SD = 22.32, α = .91 at the University of South Alabama. The scale is considered to have an acceptable validity in general, correlating similarly with the same structures as the Narcissistic Personality Inventory (NPI) does, among others, low empathy, aggression, psychopathy and low agreeableness.

The subscales exhibited from good till high reliability, embracing seven aspects of the construct narcissism: Authority (α = .88, M = 20.44, SD = 5.61) with items such as “I lead rather than follow”, Self-Sufficiency (α = .77, M = 23.16, SD = 4.47) “When something needs to be done, I do it on my own”, Superiority (α = .78, M = 13.53, SD = 4.25) “I’m more talented than most other people”, Vanity (α = .88, M = 21.55, SD = 5.35) “I try to look as attractive as possible when I leave the house”, Exhibitionism (α = .88, M = 13.47, SD = 5.79) “I make myself the center of attention”, Entitlement (α = .77, M = 11.90, SD = 4.48) “I expect to be treated better than

average” and Exploitativeness (α = .86, M = 10.61, SD = 5.32) “I’ll do whatever it takes to get ahead, even if it means some people get hurt”, following the factors of grandiose narcissism identified by Raskin and Terry (1988), similarly to NPI.

For the present study, the items were randomly mixed, leading participants to answer as sincerely as possible, instead of circling answer options out of habit.

Social Influence Scale for Technology Design and Transformation. The Social Influence Scale for Technology and Transformation (Stibe & Cugelman, 2019) deepens the understanding of social susceptibility, by assessing seven forms of sociability: Social-Learning “I learn new skills by observing others”, Norms “I prefer to act the way everyone else is acting”, Cooperation “I enjoy collaborating with people”, Comparison “I frequently compare how I am doing, relative to other people”, Competition “I enjoy participating in competitions”, Facilitation “When I see people doing something I’m interested in, I feel like doing it too” and Recognition “I enjoy when my achievements are acknowledged in public”.

Each of them builds a construct with six theory-driven items, both positively and negatively framed, providing a total number of 42 items. The reliability of the subscales varies between Cronbach's alpha = .84 and .95. The subscales' reliability in accordance with the previous listing is as follows: Cronbach's alpha = .87, .85, .91, .95, .94, .84, and .95. The construct validity was proven and measured in two studies by analyzing the responses of 135 and 134 subjects, respectively. For the confirmatory analysis, data of 125 subjects (55.2% female and 44.8% male) was used, with the age ranging from 21 to 82, provided by Amazon's Mechanical Turk. Regarding the internal consistency and discriminant validity, the constructs in the model show composite reliability scores ranging from .88 to .96. In consonance with the authors, the similar formulated items of the test were presented in a mixed order.

Perceived Stress Questionnaire (PSQ). The Perceived Stress Questionnaire (Levenstein et al., 1993) is a self-reported measure, assessing subjective stress load in the period of the last four weeks. For the current study the modified German version (Fliege et al., 2009) was used.

The version used for the current study consists of 30 items (PSQ-30) in seven subscales: 1. Harassment “You feel safe and protected”, 2. Irritability “You are irritable or grouchy”, 3. Fatigue “You are full of energy“, 4. Overload “You have enough time for yourself“, 5. Worries “You fear you may not manage to attain your goals”, 6. Tension “You feel tense” and 7. Joy “You enjoy yourself”.

In terms of reliability, PSQ-30's subscales showed sufficient Cronbach's alphas from .80 to .86. and also similar values were obtained for the split-half reliability. Regarding its validity, the factor Tension showed a high negative correlation with the physical Organization Quality of Life dimension of the World Health Organization (WHO) Quality of Life questionnaire. The factors Worries, Tension and the overall experience of stress correlated highly negatively, and the factor Joy highly positively with the psychological domain of the WHO quality of life questionnaire. Also, a negative correlation could be detected between social support measured with the Social Support Questionnaire (Sarason et al., 1983) and the subjective experience of stress. The determination of criterion validity assessed N = 50 subjects. A higher score in the stress factor could be associated with a higher immunological imbalance. The standardization was carried out on N = 650 subjects varying from 17 to 79 years of age.

This test served merely as a distraction from the actual purpose of the experiment.

Procedure

The experiment took place between the end of January and the end of March 2022 in an experimental laboratory provided by the University of Vienna. The laboratory consisted of ten seats, each separated by a wall, in compliance with the current Covid-19 regulations, which also allowed an undisturbable atmosphere during participation.

Subjects encountered the experiment online or via flyers. By clicking on the QR-Code or contacting the experimenter via the email address provided, they could book an appointment on their own at the website of the scheduling tool *Appointlet* directly by clicking on the date wished and leaving their full name. A short description including a cover story of the study was provided on the website, with the alleged purpose of the investigation being stress and personality traits. *Appointlet* provides the possibility for scheduling up to 10 meetings simultaneously, which was ideal for the testing room capacity and the group setting of the experiment. Subjects then got a reminder email from the experimenter shortly before the booked date, providing the address again as well as the exact time of the testing including its duration (30 minutes). A group of people who chose the same date were randomly assigned to either the experimental or the control group. In both of the groups, up to 10 subjects were tested simultaneously, which made a deeper look into the social components of the experimental setting possible.

Participants were led to the laboratory and informed about the broad construct of the experiment and the procedure. Each participant had their own box with a table, upon which an introduction (a short description of the experiment, a sentence implying their informed consent to the participation by moving on to the next page, inclusive of their right to withdraw from participation at any time during the

experiment), the questionnaires, measuring demographics, stress and the constructs of interests, (susceptibility to social influence and narcissism), as well as a blue and a white envelope were put on. It was pointed out that the envelopes will be opened later after the experimenter would imply to do so. Participants were told that the experiment consisted of two parts: first, there were questionnaires to fill out, then a game, played together in the group. Subjects were presented to two separated boxes afterward, which were of importance for handing in the papers. While the first one served for the questionnaires, the other was for the game later. The usual completion of the whole experiment took about 20 minutes. After having completed the surveys, participants were asked to place them in the first box.

The matrix task was carried out with a similar procedure as stated in Zhong and colleagues (2010). The blue envelope contained €10 in 50 cents, the maximal amount of money that could be gained during the task. In compliance with the usual procedure regarding the matrix paradigm in literature, subjects could keep €0.50 from the blue envelope for each reported pair found. The subjects were instructed to open the white envelope, containing a description of the task presented by a sample matrix, and the instruction to find matrix pairs that add up to exactly 10.00, as well as the worksheet itself including the 20 matrices. 30 seconds were given in order to read everything through, clear uncertainties, so as another 5 minutes for solving the task and finding pairs. Thereafter, the experimenter said:

> The time is up, please count the pairs that you have found, take your money that you won, and put everything that remained, if money, then money, as well as all the other papers, your worksheet and instruction paper in the white envelope. If you are done, drop everything in box 2, there, next to the window.

For preserving the perceived non-detectability of dishonest reports, a matching number written with invisible ink on the sheets, envelopes and questionnaires served for the experimenter for identifying the actual and stated achievements, the money taken, as well as the constructs of interests measured.

In the experimental condition, the instruction paper also contained a negative sentence implying an easy task “On average, 6 out of 12 people find all the pairs within 5 minutes”, pursuing to evoke social comparison and induce low self-esteem. 3 minutes after having started the task, the confederate actor stood up and said, “I found all pairs, my blue envelope is empty. Should I drop it in the box as well?” and left the room after the experimenter replied with “Yes, if you found every pair, please drop the blue envelope along with the white one and papers in the box.”
This was believed to establish the cheating behavior (Gino et al., 2009), normalize cheating, and reinforce the induced low self-esteem elicited by previous information about the average achievement.

Due to the diverse schedule of the subjects as well as the Covid-19 situation in Austria, in which some health regulations limited the number of people permitted to be present in the same place, the number of attendees differed in February than in March, which might have had an effect on the behavior of the participants, allowing them to feel safer to cheat. This variable was controlled in the statistics.

Data processing

The data were analyzed using *IBM SPSS Statistics* (Version 26, 2019). The dependent variable *Lies* was calculated by extracting the amount of money taken from the amount of money entitled to take. A preliminary analysis suggested that the assumption of linearity of a multiple regression analysis - and consequently, of a

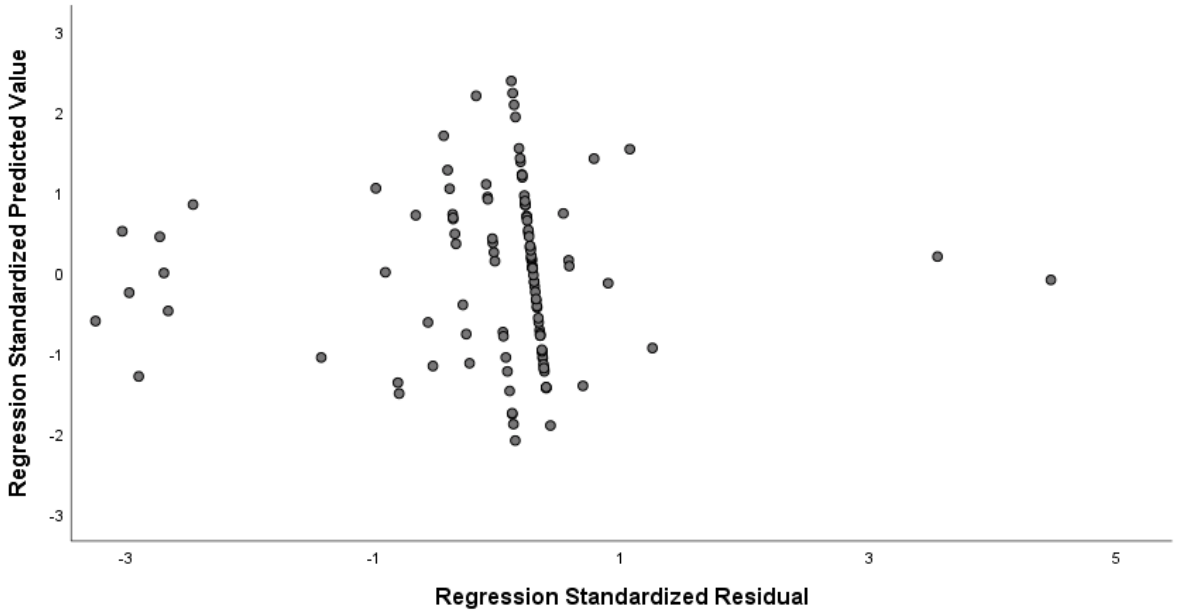
moderation analysis - has been violated (Figure 1). Therefore, the outcome (*Lies*) was recoded to a categorical variable (untruthful, truthful) and a binomial logistic regression was conducted in order to examine whether the predictors (*group*, *narcissism* and *susceptibility to social influence*) were linked to the likelihood of reporting one's truthfully reported achievement. Regarding the hypotheses about the manipulation setting (H1) and about the actual performance of subjects (H4) independent t-tests were also conducted.

According to the preliminary analyzes, the continuous predictors met the linearity assumption as regards to the logit by showing non-significance: Log_Narcissism by Narcissism (B = .06, SE = .09, p = .517) and Log_Social Susceptibility by Social Susceptibility (B = .04, SE = .09, p = .697).

The analysis for outliers showed Cook´s distance and Leverage values within the normal range, implying no outliers. Standardized Residuals were within the expected ±1.96 range. The assumption of independence of observations was granted by the experimental design itself. There was no evidence of multicollinearity (Narcissism, Tolerance = .96, VIF = 1,04; Social Susceptibility, Tolerance = .99, VIF = 1,01).

Figure 1

Violated linearity assumption of the dependent variable "Lies"

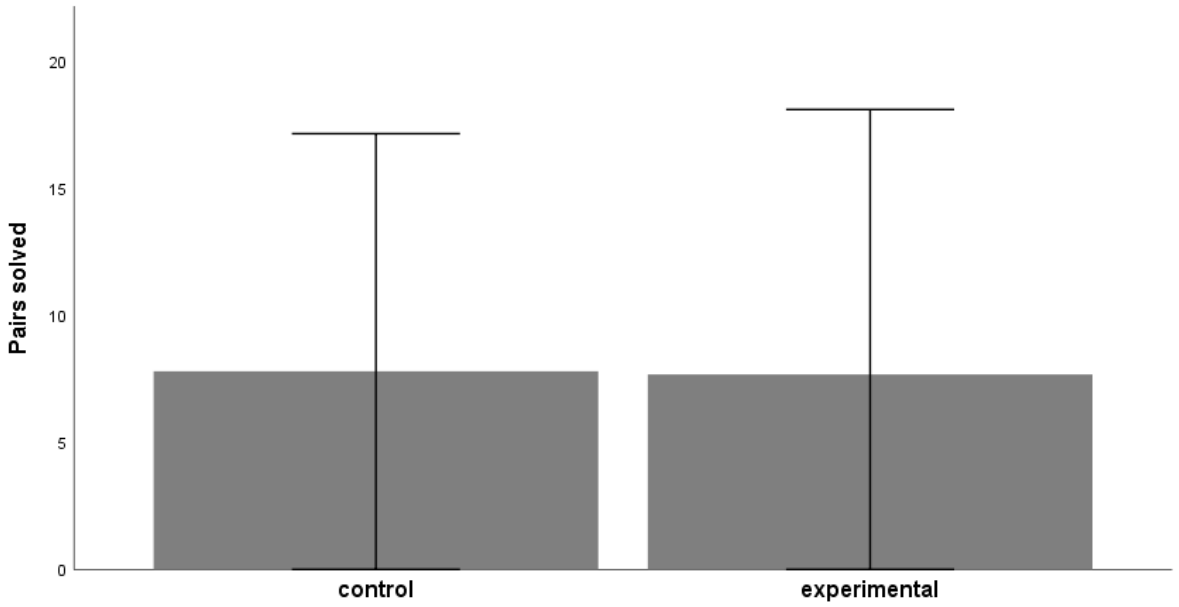


Results

Regarding the actual performance (Figure 2), the 61 participants in the induced low self-esteem condition (M = 7.69, SD = 5.23) compared to the 59 subjects in the control group (M = 7.81, SD = 4.69) showed no significant differences (Table 2) $t(118) = .14$, $p = .891$).

Figure 2

Mean of Solved Pairs Across Conditions



Note. Error bars show standard deviations. See values in the text.

Table 2

Independent Samples Test for Solved Pairs

		Levene´s Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Dif.	
		F	Sig.	t	df	Sig (2-tailed)	Mean Dif.	St. Error Dif.	Lower	Upper
Solved Pairs	Equal variances assumed	.255	.615	.138	118	.891	.125	.907	–1.672	1.922

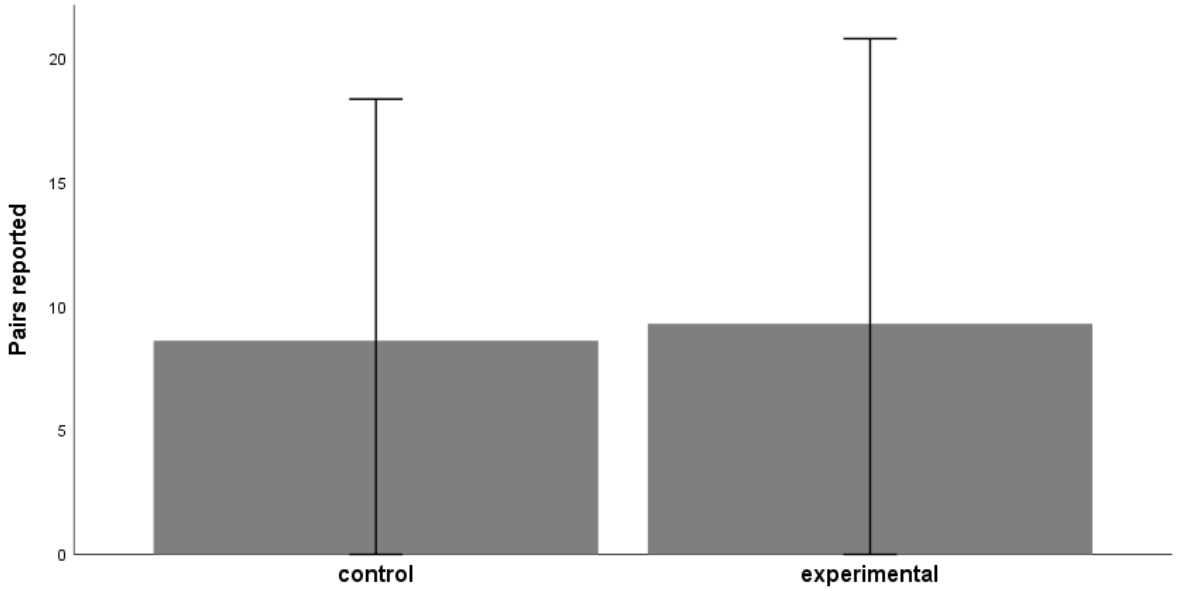
Note. [a]Dif = Difference

[b]The effect sizes are not displayed due to the non-significant results

Figure 3 shows that reported found pairs were higher in the experimental (M = 9.31, SD = 5.76) compared to the control condition (M = 8.63, SD = 4.88), but failed to prove significance (Table 3), t(118)= -.70, p = .485).

Figure 3

Mean of Reported Pairs Across Conditions



Note. Error bars show standard deviations. See values in the text.

Table 3

Independent Samples Test for Reported Pairs

		Levene´s Test for Equality of Variances		t-test for Equality of Means					
								95% Confidence Interval of the Dif.	
		F	Sig.	t	df	Sig (2-tailed)	Mean Dif.	St. Error Dif.	Lower	Upper
Reported Pairs	Equal variances assumed	1.946	.166	-.701	118	.485	-.684	.976	–2.617	1.248

[a]The effect sizes are not displayed due to the non-significant results

Out of 120 subjects, 44 overreported their achievements (36,7%).

The forced entry binomial logistic regression model (Table 4) failed to prove statistical significance $\chi^2(3, N = 120) = 1.57$, $p = .665$.

The model explained between 1.3% (Cox & Snell R Square) and 1.8% (Nagelkerke R Square) of the variance in the outcome and classified 60.3% of cases.

The predictors *group* (B = -.4, SE = .39, p = .305, 95% CI [.31, 1.44]), *narcissism* (B = .004, SE = .01, p = .712, 95% CI [.99, 1.02]) and *social susceptibility*

(B = .01, SE = .01, p = .535, 95% CI [.99, 1.02]) were found to be non-significant (Table 4).

Table 4

Logistic regression analysis

							95% C.I. for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp (B)	Lower	Upper
Group	-.397	.388	1.051	1	.305	.672	.314	1.437
Narcissism	.004	.010	.137	1	.712	1.004	.985	1.023
Social Susceptibility	.005	.009	.384	1	.535	1.005	.989	1.022
Constant	-.300	1.979	.023	1	.879	.740		

Note. Variables were entered in forced entry order.

[a]95% C.I. = 95% Confidence Interval.

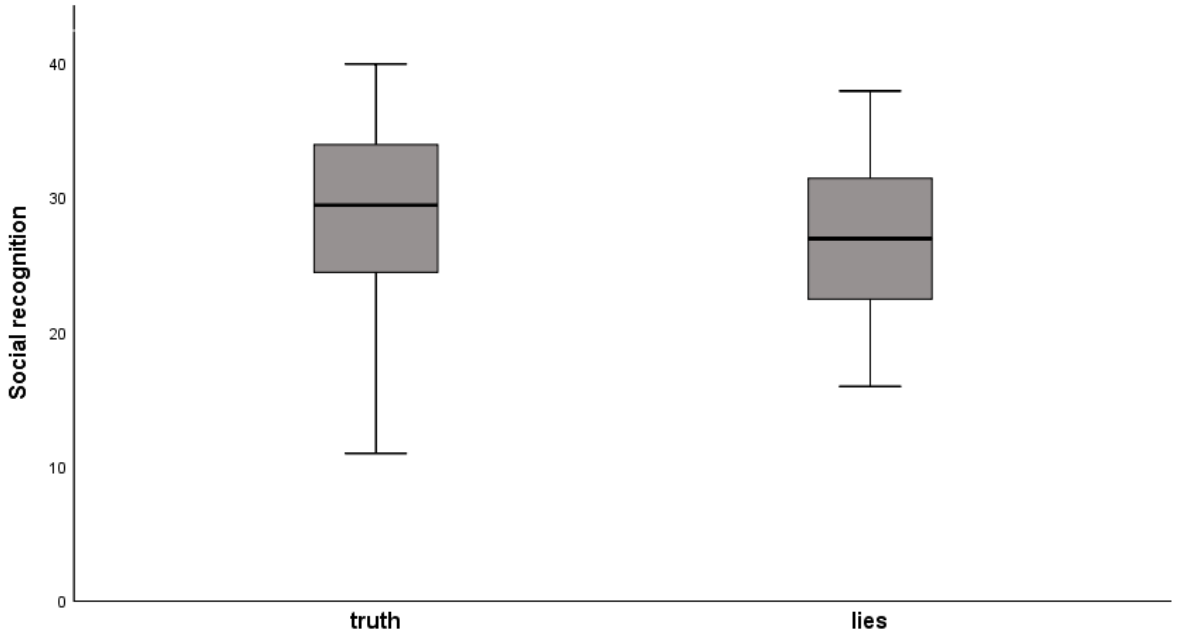
A Homer-Lemeshow test was calculated to examine the goodness of fit of the logistic mode showed a $\chi^2(8) = 5.86$ and was not significant, $p = .663$ suggesting the data provided adequate overall fit of the model.

In the separated analysis the model with the subscale *Social Recognition* as a predictor for truth-telling alone $\chi^2(3, N = 120) = 3.79$, $p = .051$, proved a nearly significant (B = .06, SE = .03, p = .056) result, explaining between 3.1% (Cox &

Snell R Square) and 4.3% (Nagelkerke R Square) of the variance in the outcome. This has been also supported by a nearly significant small correlation between *Social Recognition* and truth-telling (Figure 4) r(120) = .18, p = .053.

Figure 4

Point-biserial correlation between truth-telling and social recognition



Note. See values in text.

Discussion

The aim of the present work was to identify possible relationships between lying behavior, susceptibility to social influence and narcissism in the matrix paradigm under a control vs. low-induced self-esteem condition. The hypothesis H0 could not have been rejected, no significant differences could be found between the conditions regarding self-reported performance. Also, a connection between susceptibility to social influence (H2), narcissism (H3) and truth-telling failed to prove

significant results. Although one subscale (*Social Recognition)* out of seven of the predictor *Susceptibility to Social Influence* revealed a slight tendency for significance, it is not enough to make conclusions sufficiently. Merely, the assumption of not having significant differences in the real performance between the groups (H4) could be proven.

Validity of the Matrix Task

Since none of the hypotheses derived from the literature regarding lying behavior and personality traits could be confirmed, a possible explanation may be grounded in a critique concerning the effectiveness of the matrix task in assessing lying behavior. Although the matrix task is a well-established method to assess cheating behavior, there is rising critique from Heyman and colleagues (2020) questioning its validity, implying that differences between stated and solved pairs would rather have their roots in miscalculating under time pressure than an obvious intention to distort reality. Adding numbers could cause miscalculations (Klein et al., 2010), especially when there are multiple digit numbers to count. As the matrices offer similar numbers up to one decimal place and subjects would want to solve as many as possible while working under time pressure, it may lead to incautious checking of the answers, a so-called phenomenon of speed-accuracy tradeoff (Heitz, 2014). Even if participants think that there might have been some miscalculation, presumably it would occur rather explicitly, or they would not waste time (of others) on reevaluation afterward. This phenomenon certainly differs in terms of the exact intention to deceive or steal. In the sample of the present work, only very few subjects provided written proof to consciously recalculate for not taking more money than they were entitled to. To my knowledge, this possibility was built in only one study (Kajackaite, 2018), which found that 29% of subjects either over or

underreported their results, possibly by mistake. Also in this regard, if we consider cheater subjects only, who have reported more than one pair difference from the actual performance, the percentage of considered liars drops from 36.6% to 8.3% in the current sample, which would possibly require a bigger sample size to detect underlying mechanisms.

Studies showed that a substantial proportion of individuals behave completely honestly despite material incentives (Gerlach et al., 2019) and that individuals are less willing to steal than lie about luck, for it is associated with higher moral costs intrinsically (Kajackaite, 2018; Hermann & Mußhoff, 2019).

Further supporting this issue, it is to note, that the majority of the other studies assessing the matrix paradigm contained other cheat-boosting factors unwillingly that could contribute to misreport one's achievement, besides the task itself (Heyman et al., 2020). One of these is the use of actual result-verifying vs. shredder conditions, where subjects need to destroy their worksheet or throw it in the garbage (Isakov & Tripathy, 2017; Klimm, 2019; Mead et al., 2009; Wu et al., 2017; Pettit et al., 2016; Seçilmiş, 2017; Rigdon & D'Esterre, 2012;Shu & Gino, 2012 among others) which might have caused demanding effects or evoked suspicion that the experimenter may be in favor of cheating. This assumption was also briefly addressed by Gino and colleagues (2013). Also, many studies (Mazar et al., 2008; Wiltermuth, 2011; Nicholls et al., 2009 among others) used deceivers (unsolvable matrices), which could have contributed participants to justify their cheating behavior. These factors were not an issue in the present study, as there were no shredding conditions and no deceivers, so the experiment imitated a usual survey-taking setting with a game afterward.

Another thing to consider is that very few articles (Roeser et al., 2016; Nicholls et al., 2009; Chen et al., 2014) mentioned measuring personality traits alongside the matrix task, which this study intended to do, having two out of four hypotheses in connection with that matter. There is a chance that subjects who really had the intention of cheating were also less willing to give truthful answers, or they acted upon response - or survey taking fatigue while filling out the questionnaires. In connection with the former, here is to note that the study was conducted on-site, which might have been regarded as an extra effort. To the latter could have potentially led to the fact that both questionnaires for narcissism and susceptibility to social influence contain similar formulated items in order to measure constructs more precisely. However, the duration of the experiment of 25 minutes is not considered to be that extensive for an at least €8 reward. In addition, socially desirable responding is also possible, especially when it came to narcissistic tendencies.

Limitations

Sample and Questionnaires

A possible weak spot of the current study could lie in the sample. People who are willing to participate in psychological studies do that often out of curiosity and a desire to help. These reasons are not ideal for investigating lying behavior, as would e.g. compulsory participation as part of a seminar. Also, due to a great difference in willingness related to the participation across genders, an unequal over-representation of female subjects could not be avoided in this sample.

On the other hand, many of the studies in matrix-task reported similar samples, overrepresentation or circumstances regarding applications for participation.

Manipulation Setting

Another aspect is the importance of the manipulation setting. This concerned the exact order of the two parts, surveys and matrix tasks. In the case of the latter presented first, subjects would have cheated presumably less, since they should have had to stay on the site for another 20 minutes, instead of leaving with relief that their behavior could not be detected anymore. Cutting the parts into two separate sessions would have meant a greater effort on the part of the participants, which eventually would have caused a greater amount of dropouts. This previous consideration led to the decision to go with presenting the questionnaires first, as well as leaving the matrix task at last. There was a concern about whether it would be suspicious for subjects, first having several questions about social influence, then witnessing the actor's behavior and the sudden possibility to „cheat“ by the experimenter not checking the correctness of answers right away. These doubts after having spoken with the subjects turned out to be irrelevant: due to the diversity of constructs measured as well as the time pressure, participants did not assume the real purpose nor felt the dubiousity of the seemingly careless experimenter.

Similarly, a gender difference between the experimenter - as a potential victim of the cheating process - and the confederate - as a potential instigator -, as well as the sex of the subjects could have been of importance in terms of the imitation behavior. However, Fischbacher and Föllmi-Heusi (2013) found that people did not take interest in the experimenter's judgment, at least not in the die rolling paradigm. Also, there were attempts to counteract this effect in this study by making e.g. an unidentifiable victim as the experimenter had spoken of herself as a third party and the matrix paradigm is not regarded as a paradigm with an identifiable victim (Gerlach et al., 2019) in the literature. Derived from the articles about cheating

behavior, in both of the conditions were circumstances created which could have had a supportive role in establishing a possible cheating behavior.

Another reason why the null hypothesis could not be rejected could be the ineffectiveness of the induced low self-esteem condition. Although many studies initiated an onset for one minute after starting the task, it was decided to shift it to 3 minutes in this study. The reasons behind that were that witnessing such unashamed cheating behavior so early could have caused more to a similar effect to the excessive saliency effect mentioned before; evoking a greater sense of morality, and consequently, reflection of one's own actions, or a greater sympathy for the experimenter. Another reason behind that decision was to reinforce the induced low self-esteem, elicited by the statement about general performance previously.

Nonetheless, the later appearance could have resulted in a negative interference with the cheating behavior, either because at that time the subjects were already too focused on the task to pay attention or they did not consider that as cheating, although subjects find only seven pairs on average during a 5 minute time-frame.

Another factor could have been that the fake information on the sheet in terms of the average performance “On average, 6 out of 12 people find all the pairs within 5 minutes” was not enough to elicit social comparison and low self-esteem, yet, a greater exaggeration led to disbelief in the practice trial.

Conclusion

Although the present study has some limitations besides the overrepresentation of female participants, which could have altered the initial reaction of subjects, such as a possible enhanced sympathy towards the experimenter instead of the confederate or being merely too focused on the task at

the point of the actors´ appearance, the results of this study could be seen as a supporting factor of previous critiques regarding the effectiveness of the matrix task as a lying paradigm, implying an essential role of miscounting or demanding effects in previous samples. Nonetheless, future studies are needed to investigate for more evidence, such as replications of the experiment by Heyman and colleagues, replications of the matrix task without explicit cheating-favoring conditions, a broader assessment of the participants' solving techniques and strategies preferring speed over precision or the other way around, as well as their capacity to hold attention.

Moreover, since lying behavior embraces a complex system with diverse initiating motives behind lying also in the matrix task alone (e.g. cheating for outweighing the unpleasant task or long ride to the testing), as well as due to the possible connection between cheating and being untruthful at the questionnaires, further research should investigate the diverse facets of the experimental condition separately. These should include different ways of assessing the constructs measured, as well as investigate possible effects of timing differences in terms of the actors´appearance or the possible role of his gender compared to the experimenter or subjects.

References

Abeler, J., Nosenzo, D., & Raymond, C. (2016). Preferences for Truth-Telling. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2866381

Albertazzi, A. (2021). Individual cheating in the lab: a new measure and external validity. Theory and Decision. https://doi.org/10.1007/s11238-021-09841-0

Allingham, M.G., & Sandmo, A. (1972). Income tax evasion: A theoretical analysis. *Journal of Public Economics, 1,* 323–338.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: Author.

Appointlet: Online Appointment Scheduling Software. (2021, April 22). http://appointlet.com

Aronson, E., & Mettee, D. R. (1968). Dishonest behavior as a function of differential levels of induced self-esteem. *Journal of Personality and Social Psychology, 9*(2), 121–127. https://doi.org/10.1037/h0025853

Ashton, M. C., & Lee, K. (2016). Age trends in HEXACO-PI-R self-reports. *Journal of Research in Personality*, *64*, 102–111. https://doi.org/10.1016/j.jrp.2016.08.008

A World of Lies. (2006). Journal of Cross-Cultural Psychology, 37(1), 60–74. https://doi.org/10.1177/0022022105282295

Azizli, N., Atkinson, B. E., Baughman, H. M., Chin, K., Vernon, P. A., Harris, E., & Veselka, L. (2016). Lies and crimes: Dark Triad, misconduct, and high-stakes deception. *Personality and Individual Differences*, *89*, 34–39. https://doi.org/10.1016/j.paid.2015.09.034

Bandura, A., Ross, D., & Ross, S.A. (1961). Transmission of aggression through imitation of aggressive models. *Journal of Abnormal and Social Psychology*, 63, 575–582.

Bazerman M.H., Tenbrunsel A.E. (2012). *Blind Spots: Why we Fail to Do What's Right and What to Do About it*. Princeton University Press: Princeton, New Jersey.

Békir, I., Harbi, S. El., Grolleau, G., Mzoughi, N., & Sutan, A. (2015). The Impact of Monitoring and Sanctions on Cheating: Experimental Evidence from Tunisia. Managerial and Decision Economics, 37(7), 461–473. https://doi.org/10.1002/mde.2731

Biland, C.,(2018). *A hazugság pszichológiája*. (Jakabffy, È., Jakabffy, I. Trans.) Budapest: Háttér Kiadó KFT.

Błachnio, A., & Weremko, M. (2012). Academic Cheating is Contagious: the Influence of the Presence of Others on Honesty. A Study Report. *International Journal of Applied Psychology*, *1*(1), 14–19. https://doi.org/10.5923/j.ijap.20110101.02

Blandón-Gitlin, I., Fenn, E., Masip, J., & Yoo, A. H. (2014). Cognitive-load approaches to detect deception: searching for cognitive mechanisms. *Trends in Cognitive Sciences*, *18*(9), 441–444. https://doi.org/10.1016/j.tics.2014.05.004

Campos, V. F., Valle, M. A., & Bueno, J. L. O. (2022). Cheating Modulated by Time Pressure in the Matrix Task. *Trends in Psychology*. https://doi.org/10.1007/s43076-022-00148-9

Cappelen, A. W., Sørensen, E. Ø., & Tungodden, B. (2013). When do we lie? *Journal of Economic Behavior & Organization*, *93*, 258–265. https://doi.org/10.1016/j.jebo.2013.03.037

Capraro, V. (2018). Gender differences in lying in sender-receiver games: A meta-analysis. *ArXiv:1703.03739 [Physics, Q-Bio]*. https://arxiv.org/abs/1703.03739

Chen, J., Tang, T. L.-P., & Tang, N. (2014). Temptation, Monetary Intelligence (Love of Money), and Environmental Context on Unethical Intentions and Cheating. *Journal of Business Ethics*, *123*(2), 197–219. https://doi.org/10.1007/s10551-013-1783-2

Childs, J. (2012). Gender differences in lying. *Economics Letters*, *114*(2), 147–149. https://doi.org/10.1016/j.econlet.2011.10.006

Christ, S. E., Van Essen, D. C., Watson, J. M., Brubaker, L. E., & McDermott, K. B. (2008). The Contributions of Prefrontal Cortex and Executive Control to Deception: Evidence from Activation Likelihood Estimate Meta-analyses. *Cerebral Cortex*, *19*(7), 1557–1566. https://doi.org/10.1093/cercor/bhn189

Corcoran, K. J., & Hankey, J. (1989). Cheating Following Success and Failure in Heavy and Moderate Social Drinkers. *The Journal of General Psychology*, *116*(3), 311–316. https://doi.org/10.1080/00221309.1989.9917765

Daumiller, M., & Janke, S. (2019). Effects of performance goals and social norms on academic dishonesty in a test. *British Journal of Educational Psychology*, *90*(2), 537–559. https://doi.org/10.1111/bjep.12310

David, L. T. (2015). Academic Cheating in College Students: Relations among Personal Values, Self-esteem and Mastery. *Procedia - Social and Behavioral Sciences*, *187*, 88–92. https://doi.org/10.1016/j.sbspro.2015.03.017

Del Giudice, M., & Colle, L. (2007). Differences between children and adults in the recognition of enjoyment smiles. *Developmental Psychology*, *43*(3), 796–803. https://doi.org/10.1037/0012-1649.43.3.796

DePaulo, B. M., Lindsay, J. J., Malone, B. E., Muhlenbruck, L., Charlton, K., & Cooper, H. (2003). Cues to deception. *Psychological Bulletin*, *129*(1), 74–118. https://doi.org/10.1037/0033-2909.129.1.74

Dickinson, K. A., & Pincus, A. L. (2003). Interpersonal Analysis of Grandiose and Vulnerable Narcissism. *Journal of Personality Disorders*, *17*(3), 188–207. https://doi.org/10.1521/pedi.17.3.188.22146

Dike, C. (2008). Pathological lying: Symptom or disease? *Psychiatric Times, 25*(7), 67–73.

Dreber, A., & Johannesson, M. (2008). Gender differences in deception. *Economics Letters*, *99*(1), 197–199. https://doi.org/10.1016/j.econlet.2007.06.027

Dumas, T. M., Maxwell-Smith, M., Davis, J. P., & Giulietti, P. A. (2017). Lying or longing for likes? Narcissism, peer belonging, loneliness and normative versus deceptive like-seeking on Instagram in emerging adulthood. *Computers in Human Behavior*, *71*, 1–10. https://doi.org/10.1016/j.chb.2017.01.037

Ekman, P. (1988). Lying and nonverbal behavior: Theoretical issues and new findings. *Journal of Nonverbal Behavior*, *12*(3), 163–175. https://doi.org/10.1007/bf00987486

Ekman, P., Davidson, R. J., & Friesen, W. V. (1990). The Duchenne smile: Emotional expression and brain physiology: II. *Journal of Personality and Social Psychology, 58*(2), 342–353. https://doi.org/10.1037/0022-3514.58.2.342

Ekman, P. (1992). *Telling lies ; clues to the deceit in the marketplace, politics, and Marriage*. W.W. Norton & Company.

Ekman, P., Friesen, W. V., and Hager, J. C. (2002). *The Facial Action Coding System: A Technique for the Measurement of Facial Movement*. San Francisco, CA: Consulting Psychologists Press.

Esteves, G. G. L., Oliveira, L. S., de Andrade, J. M., & Menezes, M. P. (2020). Dark triad predicts academic cheating. *Personality and Individual Differences*, 110513. https://doi.org/10.1016/j.paid.2020.110513

Farias, J. E. M., & Pilati, R. (2021). *Following the crowd: The effects of descriptive norms and self-esteem on dishonest behavior*. https://doi.org/10.31234/osf.io/z68wa

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*, 1149-1160.

Fischbacher, U. & Föllmi-Heusi, F. (2013). Lies in Disguise—An Experimental Study on Cheating, *Journal of the European Economic Association, 11*(3), 525–547. https://doi.org/10.1111/jeea.12014

Fliege, H., Rose, M., Arck, P., Levenstein, S. & Klapp, B. F. (2009). PSQ. Perceived Stress Questionnaire. In Leibniz-Institut für Psychologie (ZPID) (Ed.), Open Test Archive. Trier: ZPID. http://dx.doi.org/10.23668/psycharchives.5138

Foster, J. D., McCain, J. L., Hibberts, M. F., Brunell, A. B., & Burke Johnson, R. (2015). The Grandiose Narcissism Scale: A Global and Facet-Level Measure

of Grandiose Narcissism. *Personality and Individual Differences*, *73*, 12–16. https://doi.org/10.1016/j.paid.2014.08.042

Friesen, L., & Gangadharan, L. (2012). Individual level evidence of dishonesty and the gender effect. *Economics Letters*, *117*(3), 624–626. https://doi.org/10.1016/j.econlet.2012.08.005

Gerlach, P., Teodorescu, K., & Hertwig, R. (2019). The truth about lies: A meta-analysis on dishonest behavior. *Psychological Bulletin*, *145*(1), 1–44. https://doi.org/10.1037/bul0000174

Gino, F., Ayal, S., & Ariely, D. (2009). Contagion and Differentiation in Unethical Behavior. *Psychological Science*, *20*(3), 393–398. https://doi.org/10.1111/j.1467-9280.2009.02306.x

Gino, F., Krupka, E. L., & Weber, R. A. (2013). License to Cheat: Voluntary Regulation and Ethical Behavior. *Management Science*, *59*(10), 2187–2203. https://doi.org/10.1287/mnsc.1120.1699

Grolleau, G., Kocher, M. G., & Sutan, A. (2016). Cheating and Loss Aversion: Do People Cheat More to Avoid a Loss? *Management Science*, *62*(12), 3428–3438. https://doi.org/10.1287/mnsc.2015.2313

Gylfason, H. F., Arnardottir, A. A., & Kristinsson, K. (2013). More on gender differences in lying. *Economics Letters*, *119*(1), 94–96. https://doi.org/10.1016/j.econlet.2013.01.027

Hart, C. L., Lemon, R., Curtis, D. A., & Griffith, J. D. (2020). Personality Traits Associated with Various Forms of Lying. *Psychological Studies*, *65*(3), 239–246. https://doi.org/10.1007/s12646-020-00563-x

Harter, S., & Leahy, R. L. (2001). The Construction of the Self: A Developmental Perspective. *Journal of Cognitive Psychotherapy*, *15*(4), 383–384. https://doi.org/10.1891/0889-8391.15.4.383

Heitz, R. P. (2014). The speed-accuracy tradeoff: history, physiology, methodology, and behavior. *Frontiers in Neuroscience*, *8*. https://doi.org/10.3389/fnins.2014.00150

Hermann, D., & Mußhoff, O. (2019). I might be a liar, but I am not a thief: An experimental distinction between the moral costs of lying and stealing. *Journal of Economic Behavior & Organization*, *163*, 135–139. https://doi.org/10.1016/j.jebo.2019.05.009

Heyman, T., Vankrunkelsven, H., Voorspoels, W., White, A., Storms, G., & Verheyen, S. (2020). When Cheating is an Honest Mistake: A Critical Evaluation of the Matrix Task as a Measure of Dishonesty. *Collabra: Psychology*, *6*(1), 12. https://doi.org/10.1525/collabra.294

Houser, D., Vetter, S., & Winter, J. (2012). Fairness and cheating. *European Economic Review*, *56*(8), 1645–1655. https://doi.org/10.1016/j.euroecorev.2012.08.001

IBM Corp. (2019). IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp. [Computer software].

Isakov, M., & Tripathy, A. (2017). Behavioral correlates of cheating: Environmental specificity and reward expectation. *PLOS ONE*, *12*(10). https://doi.org/10.1371/journal.pone.0186054

Jonason, P. K., Lyons, M., Baughman, H. M., & Vernon, P. A. (2014). What a tangled web we weave: The Dark Triad traits and deception. *Personality and Individual Differences*, *70*, 117–119. https://doi.org/10.1016/j.paid.2014.06.038

Jones, D. N., & Paulhus, D. L. (2017). Duplicity among the dark triad: Three faces of deceit. *Journal of Personality and Social Psychology*, *113*(2), 329–342. https://doi.org/10.1037/pspp0000139

Jordan, A. E. (2001). College Student Cheating: The Role of Motivation, Perceived Norms, Attitudes, and Knowledge of Institutional Policy. *Ethics & Behavior*, *11*(3), 233–247. https://doi.org/10.1207/s15327019eb1103_3

Kajackaite, A. (2018). Lying about luck versus lying about performance. *Journal of Economic Behavior & Organization*, *153*, 194–199. https://doi.org/10.1016/j.jebo.2018.07.010

Köbis, N. C., Verschuere, B., Bereby-Meyer, Y., Rand, D., & Shalvi, S. (2019). Intuitive Honesty Versus Dishonesty: Meta-Analytic Evidence. *Perspectives on Psychological Science*, *14*(5), 778–796. https://doi.org/10.1177/1745691619851778

Klein, E., Moeller, K., Dressel, K., Domahs, F., Wood, G., Willmes, K., & Nuerk, H.-C. (2010). To carry or not to carry — Is this the question? Disentangling the carry effect in multi-digit addition. *Acta Psychologica*, *135*(1), 67–76. https://doi.org/10.1016/j.actpsy.2010.06.002

Klimm, F. (2019). Suspicious success – Cheating, inequality acceptance, and political preferences. *European Economic Review*, *117*, 36–55. https://doi.org/10.1016/j.euroecorev.2019.04.008

Lapsley, D. K., & Aalsma, M. C. (2006). An empirical typology of narcissism and mental health in late adolescence. *Journal of Adolescence*, *29*(1), 53–71. https://doi.org/10.1016/j.adolescence.2005.01.008

Leal, S., & Vrij, A. (2008). Blinking During and After Lying. *Journal of Nonverbal Behavior*, *32*(4), 187–194. https://doi.org/10.1007/s10919-008-0051-0

Lee, S. D., Kuncel, N. R., & Gau, J. (2020). Personality, attitude, and demographic correlates of academic dishonesty: A meta-analysis. *Psychological Bulletin*, *146*(11), 1042–1058. https://doi.org/10.1037/bul0000300

Levenstein, S., Prantera, C., Varvo, V., Scribano, M. L., Berto, E., Luzi, C., & Andreoli, A. (1993). Development of the perceived stress questionnaire: A new tool for psychosomatic research. *Journal of Psychosomatic Research*, *37*(1), 19–32. https://doi.org/10.1016/0022-3999(93)90120-5

Liu, J., Shen, Q., Zhang, J., Beyens, U., Cai, W., Decety, J., & Li, H. (2021). The Difference Spotting Task: A new nonverbal measure of cheating behavior. *Behavior Research Methods*, *53*(5), 1935–1944. https://doi.org/10.3758/s13428-020-01526-w

Lobel, T. E., & Levanon, I. (1988). Self-esteem, need for approval, and cheating behavior in children. *Journal of Educational Psychology*, *80*(1), 122–123. https://doi.org/10.1037/0022-0663.80.1.122

Makowski, D., Pham, T., Lau, Z. J., Raine, A., & Chen, S. H. A. (2021). The structure of deception: Validation of the lying profile questionnaire. *Current Psychology*. https://doi.org/10.1007/s12144-021-01760-1

Matsumoto, D., Hwang, H. S., Skinner, L., & Frank, M. (2011). Evaluating Truthfulness and Detecting Deception. *FBI Law Enforcement Bulletin*, *80*(1). https://heinonline.org/HOL/LandingPage?handle=hein.journals/fbileb80&div=53&id=&page=

Mazar, N., Amir, O., & Ariely, D. (2008). The Dishonesty of Honest People: A Theory of Self-Concept Maintenance. *Journal of Marketing Research*, *45*(6), 633–644. https://doi.org/10.1509/jmkr.45.6.633

McCabe, D. L., & Trevino, L. K. (1993). Academic Dishonesty: Honor Codes and Other Contextual Influences. *The Journal of Higher Education*, *64*(5), 522. https://doi.org/10.2307/2959991

McCabe, D. L., Trevino, L. K., & Butterfield, K. D. (2001). Cheating in Academic Institutions: A Decade of Research. *Ethics & Behavior*, *11*(3), 219–232. https://doi.org/10.1207/s15327019eb1103_2

Mead, N. L., Baumeister, R. F., Gino, F., Schweitzer, M. E., & Ariely, D. (2009). Too tired to tell the truth: Self-control resource depletion and dishonesty. *Journal of Experimental Social Psychology, 45*(3), 594–597. *https://doi.org/10.1016/j.jesp.2009.02.004*

Miller, J. D., Price, J., Gentile, B., Lynam, D. R., & Campbell, W. K. (2012). Grandiose and vulnerable narcissism from the perspective of the

interpersonal circumplex. *Personality and Individual Differences*, *53*(4), 507–512. https://doi.org/10.1016/j.paid.2012.04.026

Milojev, P., & Sibley, C. G. (2017). Normative personality trait development in adulthood: A 6-year cohort-sequential growth model. *Journal of Personality and Social Psychology*, *112*(3), 510–526. https://doi.org/10.1037/pspp0000121

Muzinic, L., Kozaric-Kovacic, D., & Marinic, I. (2016). Psychiatric aspects of normal and pathological lying. *International Journal of Law and Psychiatry*, *46*, 88–93. https://doi.org/10.1016/j.ijlp.2016.02.036

Nathanson, C., Paulhus, D. L., & Williams, K. M. (2006). Predictors of a behavioral measure of scholastic cheating: Personality and competence but not demographics. *Contemporary Educational Psychology*, *31*(1), 97–122. https://doi.org/10.1016/j.cedpsych.2005.03.001

Nicholls, A. R., Madigan, D. J., Duncan, L., Hallward, L., Lazuras, L., Bingham, K., & Fairs, L. R. W. (2019). Cheater, cheater, pumpkin eater: the Dark Triad, attitudes towards doping, and cheating behaviour among athletes. *European Journal of Sport Science*, *20*(8), 1–7. https://doi.org/10.1080/17461391.2019.1694079

Niiya, Y., Ballantyne, R., North, M. S., & Crocker, J. (2008). Gender, Contingencies of Self-Worth, and Achievement Goals as Predictors of Academic Cheating in a Controlled Laboratory Setting. *Basic and Applied Social Psychology*, *30*(1), 76–83. https://doi.org/10.1080/01973530701866656

O'Connor, A. M., Judges, R. A., Lee, K., & Evans, A. D. (2021). Examining honesty–humility and cheating behaviors across younger and older adults. *International Journal of Behavioral Development*, *46*(2), 112-117. https://doi.org/10.1177/01650254211039022

Oliveira, C. M., & Levine, T. R. (2008). Lie Acceptability: A Construct and Measure. *Communication Research Reports*, *25*(4), 282–288. https://doi.org/10.1080/08824090802440170

O'Reilly, C. A., & Doerr, B. (2020). Conceit and deceit: Lying, cheating, and stealing among grandiose narcissists. *Personality and Individual Differences*, *154*. https://doi.org/10.1016/j.paid.2019.109627

O'Rourke, J., Barnes, J., Deaton, A., Fulks, K., Ryan, K., & Rettinger, D. A. (2010). Imitation Is the Sincerest Form of Cheating: The Influence of Direct Knowledge and Attitudes on Academic Dishonesty. *Ethics & Behavior*, *20*(1), 47–64. https://doi.org/10.1080/10508420903482616

Pettit, N. C., Doyle, S. P., Lount, R. B., & To, C. (2016). Cheating to get ahead or to avoid falling behind? The effect of potential negative versus positive status change on unethical behavior. *Organizational Behavior and Human Decision Processes*, *137*, 172–183. https://doi.org/10.1016/j.obhdp.2016.09.005

Raskin, R., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology*, *54*(5), 890–902. https://doi.org/10.1037/0022-3514.54.5.890

Rettinger, D. A., & Kramer, Y. (2008). Situational and Personal Causes of Student Cheating. *Research in Higher Education*, *50*(3), 293–313. https://doi.org/10.1007/s11162-008-9116-5

Rigdon, M. L., & D'Esterre, A. (2012). The Effects of Competition on the Nature of Cheating Behavior. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2194870

Rigdon, M. L., & D'Esterre, A. (2017). Sabotaging Another: Priming Competition Increases Cheating Behavior in Tournaments. *Southern Economic Journal*, *84*(2), 456–473. https://www.jstor.org/stable/26633353

Roeser, K., McGregor, V. E., Stegmaier, S., Mathew, J., Kübler, A., & Meule, A. (2016). The Dark Triad of personality and unethical behavior at different times of day. *Personality and Individual Differences*, *88*, 73–77. https://doi.org/10.1016/j.paid.2015.09.002

Rose, P. (2002). The happy and unhappy faces of narcissism. *Personality and Individual Differences*, *33*(3), 379–391. https://doi.org/10.1016/s0191-8869(01)00162-3

Ruffle, B. J., & Tobol, Y. (2014). Honest on Mondays: Honesty and the temporal separation between decisions and payoffs. *European Economic Review*, *65*, 126–135. https://doi.org/10.1016/j.euroecorev.2013.11.004

Sarason, I. G., Levine, H. M., Basham, R. B., & Sarason, B. R. (1983). Assessing social support: The Social Support Questionnaire. *Journal of Personality and Social Psychology*, *44*(1), 127–139. https://doi.org/10.1037/0022-3514.44.1.127

Sayette, M. A., Cohn, J. F., Wertz, J. M., Perrott, M. A., & Parrott, D. J. (2001). A psychometric evaluation of the facial action coding system for assessing spontaneous expression. *Journal of Nonverbal Behavior, 25*(3), 167–185. https://doi.org/10.1023/A:1010671109788

Schild, C., Heck, D. W., Ścigała, K. A., & Zettler, I. (2019). Revisiting REVISE: (Re)Testing unique and combined effects of REminding, VIsibility, and SElf-engagement manipulations on cheating behavior. *Journal of Economic Psychology*, *75*, 102161. https://doi.org/10.1016/j.joep.2019.04.001

Schröder-Abé, M., & Fatfouta, R. (2019). Shades of narcissistic dishonesty: Grandiose versus vulnerable narcissism and the role of self-conscious emotions. *Journal of Economic Psychology*, *71*, 148–158. https://doi.org/10.1016/j.joep.2018.06.003

Seçilmiş, E. (2017). An experimental analysis of moral self-regulation. *Applied Economics Letters*, *25*(12), 857–861. https://doi.org/10.1080/13504851.2017.1374530

Shu, L. L., & Gino, F. (2012). Sweeping dishonesty under the rug: How unethical actions lead to forgetting of moral rules. *Journal of Personality and Social Psychology, 102*(6), 1164–1177. https://doi.org/10.1037/a0028381

Simpson, J., & Weiner, E. (1989). *Oxford English dictionary*. Oxford: Clarendon Press.

Speer, S. P. H., Smidts, A., & Boksem, M. A. S. (2020). Cognitive control increases honesty in cheaters but cheating in those who are honest. *PNAS Proceedings*

of the National Academy of Sciences of the United States of America, 117(32), 19080–19091. https://doi.org/10.1073/pnas.2003480117

Sporer, S. L. (2004). Reality monitoring and the detection of deception. In P.-A. Granhag & L. Stromwall (Eds.), *Deception detection in forensic contexts*, 64-102. Cambridge, UK: Cambridge University Press.

Stibe, A., & Cugelman, B. (2019). Social Influence Scale for Technology Design and Transformation. *Human-Computer Interaction – INTERACT 2019*, 561–577. https://doi.org/10.1007/978-3-030-29387-1_33

Suchotzki, K., Berlijn, A., Donath, M., & Gamer, M. (2018). Testing the applied potential of the Sheffield Lie Test. *Acta Psychologica*, *191*, 281–288. https://doi.org/10.1016/j.actpsy.2018.10.011

Tajfel, H. (1982). *Social identity and intergroup relations.* Cambridge, England: Cambridge University Press.

Van Bockstaele, B., Verschuere, B., Moens, T., Suchotzki, K., Debey, E., & Spruyt, A. (2012). Learning to Lie: Effects of Practice on the Cognitive Cost of Lying. *Frontiers in Psychology*, *3*. https://doi.org/10.3389/fpsyg.2012.00526

Van Bockstaele, B., Wilhelm, C., Meijer, E., Debey, E., & Verschuere, B. (2015). When deception becomes easy: the effects of task switching and goal neglect on the truth proportion effect. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.01666

Verschuere, B., & in ´t Hout, W. (2016). Psychopathic Traits and Their Relationship with the Cognitive Costs and Compulsive Nature of Lying in Offenders. *PLOS ONE*, *11*(7). https://doi.org/10.1371/journal.pone.0158595

Verschuere, B., Meijer, E. H., Jim, A., Hoogesteyn, K., Orthey, R., McCarthy, R. J., Skowronski, J. J., Acar, O. A., Aczel, B., Bakos, B. E., Barbosa, F., Baskin, E., Bègue, L., Ben-Shakhar, G., Birt, A. R., Blatz, L., Charman, S. D., Claesen, A., Clay, S. L., & Coary, S. P. (2018). Registered Replication Report on Mazar, Amir, and Ariely (2008). *Advances in Methods and Practices in Psychological Science*, *1*(3), 299–317. https://doi.org/10.1177/2515245918781032

Vrij, A., (2000). *Detecting lies and deceit : the psychology of lying and the implications for professional practice*. John Wiley.

Vrij, A., Edward, K., & Bull, R. (2001). Stereotypical Verbal and Nonverbal Responses While Deceiving Others. *Personality and Social Psychology Bulletin*, *27*(7), 899–909. https://doi.org/10.1177/0146167201277012

Vrij, A., Fisher, R., Mann, S., & Leal, S. (2006). Detecting deception by manipulating cognitive load. *Trends in Cognitive Sciences*, *10*(4), 141–142. https://doi.org/10.1016/j.tics.2006.02.003

Vrij, A., & Granhag, P. A. (2012). Eliciting cues to deception and truth: What matters are the questions asked. *Journal of Applied Research in Memory and Cognition*, *1*(2), 110–117. https://doi.org/10.1016/j.jarmac.2012.02.004

Williams, K. M., Nathanson, C., & Paulhus, D. L. (2010). Identifying and profiling scholastic cheaters: their personality, cognitive ability, and motivation. *Journal*

of Experimental Psychology. Applied, *16*(3), 293–307. https://doi.org/10.1037/a0020773

Williamson, W. P., & Assadi, A. (2005). Religious Orientation, Incentive, Self-Esteem, and Gender as Predictors of Academic Dishonesty: An Experimental Approach. *Archive for the Psychology of Religion*, *27*(1), 137–158. https://doi.org/10.1163/008467206774355411

Wiltermuth, S. S. (2011). Cheating more when the spoils are split. *Organizational Behavior and Human Decision Processes*, *115*(2), 157–168. https://doi.org/10.1016/j.obhdp.2010.10.001

Wonneberg, D. A. (2007). *The Nature of Narcissism Within Organizational Leadership.* Capella University ProQuest Dissertations Publishing.

Wu, W.-H., Cheng, W., & Chiou, W.-B. (2017). Episodic Future Thinking about the Ideal Self Induces Lower Discounting, Leading to a Decreased Tendency toward Cheating. *Frontiers in Psychology, 8.* https://doi.org/10.3389/fpsyg.2017.00287

Zhong, C.-B., Bohns, V. K., & Gino, F. (2010). Good Lamps Are the Best Police. *Psychological Science*, *21*(3), 311–314. https://doi.org/10.1177/0956797609360754

Zuckerman, M., DePaulo, B. M., & Rosenthal, R. (1981). Verbal and nonverbal communication of deception. In L. Berkowitz (Ed.), *Advances in experimental social psychology, 14*, 1–59. New York: Academic Press.

Zvi, L., & Elaad, E. (2018). Correlates of narcissism, self-reported lies, and self-assessed abilities to tell and detect lies, tell truths, and believe others. *Journal of Investigative Psychology and Offender Profiling*, *15*(3), 271–286. https://doi.org/10.1002/jip.1511

Zvi, L., & Shtudiner, Z. (2021). Resume fraud and counterproductive behavior: The impact of narcissism in the labor market. *Journal of Behavioral and Experimental Economics*, *93*. https://doi.org/10.1016/j.socec.2021.101715

List of Figures and Tables

Figure 1

Violated linearity assumption of the dependent variable “Lies”

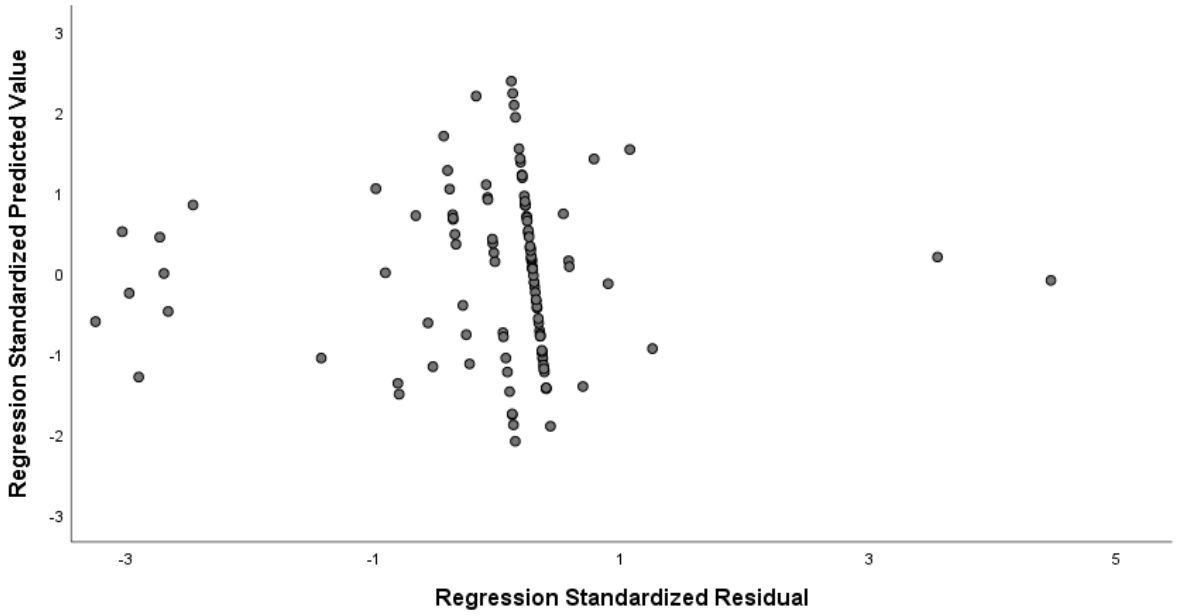
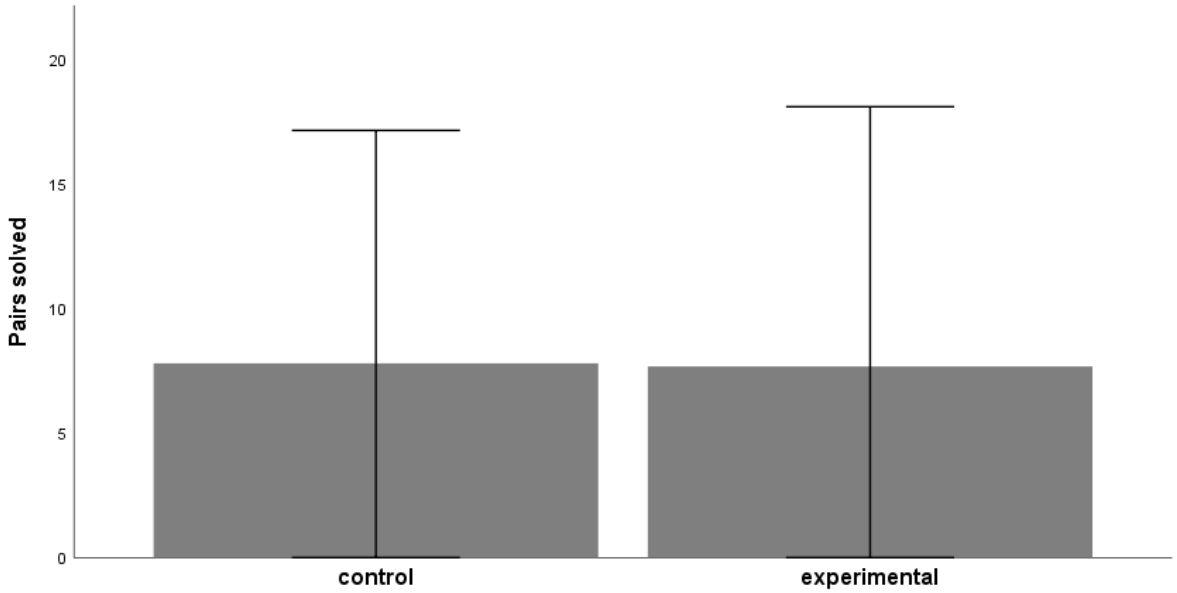


Figure 2

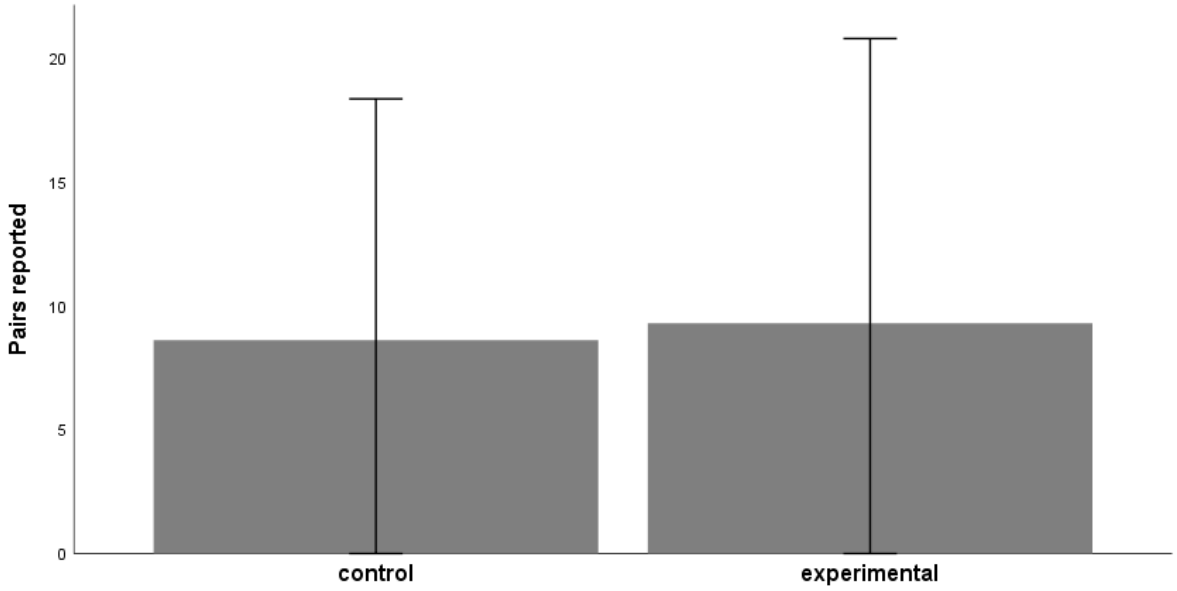
Mean of Solved Pairs Across Conditions



Note. Error bars show standard deviations. See values in the text.

Figure 3

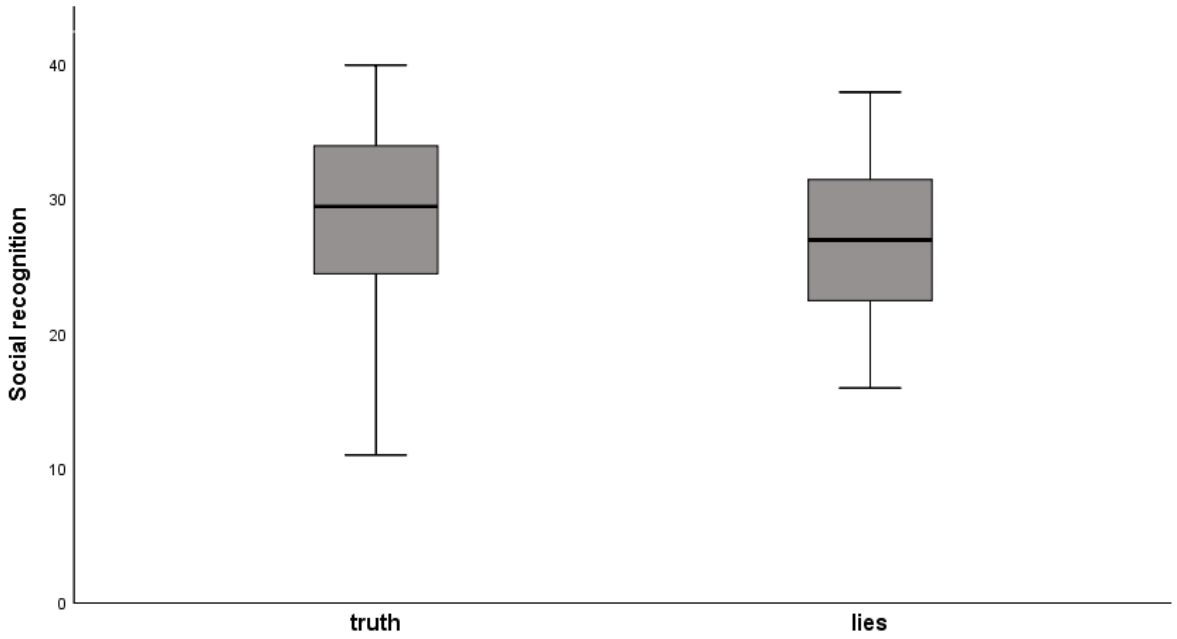
Mean of Reported Pairs Across Conditions



Note. Error bars show standard deviations. See values in the text.

Figure 4

Point-biserial correlation between truth-telling and social recognition



Note. See values in text.

Table 1

Sociodemographic Characteristics of Participants

Variable	Category	N	%
Gender	Male	39	32.5
	Female	81	67.5
Education	Elementary school	7	5.8
	High School graduate	39	32.5
	College, no degree	37	30.8
	Bachelor's degree	22	18.3
	Master´s degree	14	11.7
	Doctorate degree	1	.8
Total		120	

Variable	Category	N	%
Employment status	Unemployment	11	9.2
	Student	54	45.0
	Parttime	31	25.8
	Fulltime	20	16.7
	Pension	2	1.7
	Freelance	2	1.7
German language skills	Intermediate	20	16.6
Total		120	

Table 2

Independent Samples Test for Solved Pairs

	Levene´s Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Dif.	
	F	Sig.	t	df	Sig (2-tailed)	Mean Dif.	St. Error Dif.	Lower	Upper
Solved Pairs	Equal variances assumed	.255	.615	.138	118	.891	.125	.907	–1.672	1.922

Note. [a]Dif = Difference

[b]The effect sizes are not displayed due to the non-significant results

Table 3

Independent Samples Test for Reported Pairs

	Levene´s Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Dif.	
	F	Sig.	t	df	Sig (2-tailed)	Mean Dif.	St. Error Dif.	Lower	Upper
Reported Pairs Equal variances assumed	1.946	.166	-.701	118	.485	-.684	.976	–2.617	1.248

[a]The effect sizes are not displayed due to the non-significant results

Table 4

Logistic regression analysis

							95% C.I. for EXP(B)	
	B	S.E.	Wald	df	Sig.	Exp (B)	Lower	Upper
Group	-.397	.388	1.051	1	.305	.672	.314	1.437
Narcissism	.004	.010	.137	1	.712	1.004	.985	1.023
Social Susceptibility	.005	.009	.384	1	.535	1.005	.989	1.022
Constant	-.300	1.979	.023	1	.879	.740		

Note. Variables were entered in forced entry order. [a]95% C.I. = 95% Confidence Interval.

Appendix A

Abstracts

Abstrakt

Narzissmus, der durch Anspruchshaltung, Mangel an Schuldgefühlen und Risikobereitschaft gekennzeichnet ist, wird bekanntlich in Verbindung mit unehrlichem Verhalten gebracht. Neben bestimmten Persönlichkeitseigenschaften können auch situative Faktoren Einfluss auf die Entscheidung, sich auf unethisches Verhalten einzulassen, nehmen. Zu diesen Faktoren zählen beispielsweise induziertes geringes Selbstwertgefühl oder das Beobachten von Betrug durch andere Personen. Die vorliegende Studie hatte das Ziel, betrügerisches Verhalten im Rahmen einer Experimentalbedingung mit induziertem niedrigem Selbstwertgefühl inkl. falschen Informationen über durchschnittliche Leistung, und die Anwesenheit eines betrügenden Confederates zu untersuchen. Außerdem wurde die Frage gestellt, ob diese Beziehung durch narzisstische Tendenzen und die Anfälligkeit für soziale Beeinflussung moderiert werde. Die Proband:innen (N = 120) absolvierten eine visuelle Suchaufgabe (Matrixaufgabe), bei der sie die Möglichkeit hatten, höhere Leistungen als die tatsächlich erreichten für eine größere monetäre Belohnung zu berichten. Weder hat der betrügende Confederate das Lügenverhalten signifikant vorhergesagt, noch haben narzisstische Tendenzen und die Anfälligkeit für soziale Beeinflussung die Tendenz zum Betrug moderiert. Abgesehen von der Komplexität der Betrugsmotive inkl. möglicher Verbindung zwischen Betrug und Lügenverhalten in den Fragebögen und den Limitationen der Studie (u.a. die eventuelle Unablenkbarkeit der Proband:innen seitens des Schauspielers oder die Überrepräsentation der TeilnehmerInnen),

könnte die vorliegende Studie als ein weiterer Beleg für eine neu adressierte Kritik an der Matrixaufgabe als Lügenparadigma angesehen werden.

Abstract

Narcissism, which is characterized by a sense of entitlement, lack of guilt and risk-taking, has been known to be associated with dishonest behavior. Apart from personality, situational factors, e.g. induced low self-esteem or witnessing others to cheat have been shown to have an effect on one's decision to engage in unethical behavior. The present study aimed to investigate cheating behavior in an induced low self-esteem condition, including false information about average performance, and a presence of a cheating confederate, moreover, focusing on whether this relationship would be moderated by narcissistic tendencies and susceptibility to social influence. Subjects (N = 120) completed a visual search task (matrix task), where they had the opportunity to overreport their achievements for a greater monetary reward. Neither did a cheating confederate significantly predict lying behavior, nor did narcissistic tendencies and susceptibility to social influence moderate the tendency to overreport. Despite the complex motives behind cheating behavior including possible connections with cheaters being untruthful in the other parts of the experiment as well and limitations of the study (e.g. the subjects´ uninterrupted focus on the task at the point of the actors´appearance or the overrepresentation of female participants), the present study might be another evidence of a newly addressed criticism of matrix task as a lying paradigm.

Appendix B

Introduction of the Study

Willkommen!

Vielen Dank für Ihre Teilnahme an diesem Experiment an der psychologischen Fakultät an der Universität Wien. Im Rahmen dieser Masterarbeit werden Sie Fragen zu Ihrer Persönlichkeit und Stressbewältigung bekommen. Die Bearbeitungsdauer wird ungefähr 30 Minuten betragen.

Als Aufwandsentschädigung werden Sie €5 erhalten und haben zusätzlich die Möglichkeit, bis zu €10 extra in einem Bonusspiel zu gewinnen. Indem Sie mit der Bearbeitung anfangen, stimmen Sie der Teilnahme zu. Ihre Teilnahme ist freiwillig und kann zu jeder Zeit zurückgezogen werden. Indem Sie auf die nächste Seite gehen, stimmen Sie der Teilnahme zu.

Die Daten sind gemäß der europäischen Datenschutz-Grundverordnung (DS-GVO) geschützt und werden anonym verarbeitet.

Sollten Sie Fragen zum Experiment haben, können Sie mich unter der untenstehenden E-Mail-Adresse kontaktieren.

Appendix C

Demographic Survey Questions

Im Folgenden werden Sie zuerst ein paar demografische Fragen finden. Danach werden Sie separat über Ihr Befinden und Persönlichkeit und Stressbewältigung befragt. Bitte beantworten Sie diese Fragen möglichst genau. Es gibt keine falschen Antworten.

Alter: _____

Geschlecht: _____

Was ist Ihr höchster Schul- oder Hochschulabschluss? Bitte kreisen Sie die Antwort ein.

Unterer Schulabschluss

Matura oder gleichwertiger Abschluss

Studium ohne Abschluss

Bachelor-Abschluss

Master-Abschluss

Doktor-Grad

Welche der folgenden Kategorien beschreibt Ihren Beschäftigungsstatus am besten?

Angestellt, Teilzeit

Angestellt, Vollzeit

Ohne Beschäftigung, arbeitssuchend

Student, Studienrichtung: _____

Schüler

Pensioniert

Wie hoch ist das (netto) monatliche Einkommen in Ihrem Haushalt?

Bis 500€

500€ - 1000€

1000€ - 1500€

1500€ - 2000€

2000€ - 3000€

Mehr als 3000€

Welchen Familienstand haben Sie?

ledig

in einer Beziehung

verheiratet

geschieden

verwitwet

Wie gut sprechen Sie Deutsch?

Muttersprache

Verhandlungssicher (C1)

B2

Studieren/Studierten Sie Psychologie?

Ja:_____ Semester

Nein

Wurde bei Ihnen jemals eine psychische Störung diagnostiziert?

Ja:_____

Nein

Studieren oder studierten Sie an der Universität Wien?

Ja

Nein

Appendix D

Social Influence Scale

Als Nächstes finden Sie verschiedene Aussagen. Bitte markieren Sie, inwieweit Sie diese von 1 (stimme überhaupt nicht zu) bis 7 (stimme voll und ganz zu) zustimmen.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Weder-noch	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
01. Ich messe mich gerne mit anderen	1	2	3	4	5	6	7
02. Ich lerne nicht, indem ic andere beobachte*	1	2	3	4	5	6	7
03. Ich mag es, in der Öffentlichkeit geehrt zu werde	1	2	3	4	5	6	7
04. Wenn ich Menschen sehe, die etwas tun, das für mich relevant ist, verspüre ich kein Verlangen, damit anzufangen	1	2	3	4	5	6	7

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Weder-noch	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
05. Ich folge Verhaltensweisen,die andere normalerweise zeigen	1	2	3	4	5	6	7
06. Ich vergleiche mich mit anderen Menschen	1	2	3	4	5	6	7
07. Ich mag keine Wettbewerbe*	1	2	3	4	5	6	7
08. Ich bevorzuge neue Dinge zu lernen, indem ich bei anderen zuschaue	1	2	3	4	5	6	7
09. Ich lerne neue Fähigkeiten, indem ich bei anderen zuschaue	1	2	3	4	5	6	7
10. Ich fühle mich aufgeregt, wenn ich für meine Leistungen öffentlich anerkannt werde	1	2	3	4	5	6	7

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Weder-noch	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
11. Ich bin eine wettbewerbsorientierte Person	1	2	3	4	5	6	7
12. Ich mag es, mit anderen zusammen etwas zu schaffen	1	2	3	4	5	6	7
13. Ich genieße es, wenn meine Leistungen in der Öffentlichkeit anerkannt werden	1	2	3	4	5	6	7
14. Ich bin daran uninteressiert, mich mit anderen zu vergleichen*	1	2	3	4	5	6	7
15. Ich arbeite lieber mit anderen Menschen, als allein	1	2	3	4	5	6	7
16. Ich mag keine Anerkennung in der Öffentlichkeit erhalten*	1	2	3	4	5	6	7

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Weder-noch	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
17. Ich will nicht, dass meine Leistungen vor anderen anerkannt werden*	1	2	3	4	5	6	7
18. Ich bewerte meine Leistung im Vergleich zu anderen	1	2	3	4	5	6	7
19. Ich lerne neue Fähigkeiten, indem ich andere beobachte	1	2	3	4	5	6	7
20. Ich ziehe es vor, das zu tun, was andere Menschen normalerweise tun	1	2	3	4	5	6	7
21. Wenn ich Menschen sehe, die etwas tun, das mich inspiriert, will ich es auch tun	1	2	3	4	5	6	7
22. Wenn ich Menschen sehe, die etwas tun, das mich interessiert, hätte ich	1	2	3	4	5	6	7

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Weder-noch	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
Lust darauf, es auch zu tun							
23. Ich vermeide es, mich ungewöhnlich zu verhalten*	1	2	3	4	5	6	7
24. Ich vergleiche häufig, wie es mir im Verhältnis zu anderen Menschen geht	1	2	3	4	5	6	7
25. Ich würde es lieber vermeiden, in der Öffentlichkeit für meine Leistungen anerkannt zu werden*	1	2	3	4	5	6	7
26. Ich messe mich nicht gerne mit Menschen*	1	2	3	4	5	6	7
27. Ich genieße die Zusammenarbeit mit anderen	1	2	3	4	5	6	7

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Weder-noch	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
28. Wenn ich merke, dass andere an etwas arbeiten, das für mich wichtig ist, will ich auch damit anfangen	1	2	3	4	5	6	7
29. Wenn ich andere dabei beobachte, dass sie etwas tun, das mir wichtig ist, hat das keine Auswirkungen auf meinen Wunsch, damit anzufangen*	1	2	3	4	5	6	7
30. Um meine Fähigkeiten zu verbessern, lerne ich am besten, indem ich andere beobachte	1	2	3	4	5	6	7
31. Ich baue gerne Sachen mit anderen Menschen	1	2	3	4	5	6	7
32. Ich vergleiche mich nie mit anderen Menschen*	1	2	3	4	5	6	7

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Weder- noch	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
33. Ich arbeite nicht gerne mit anderen zusammen*	1	2	3	4	5	6	7
34. Ich kopiere nicht die Verhaltensweisen, die alle andere zeigen*	1	2	3	4	5	6	7
35. Ich bin von Natur aus keine Wettbewerbsorientierte Person*	1	2	3	4	5	6	7
36. Ich vermeide Einladungen zur Zusammenarbeit mit anderen Menschen*	1	2	3	4	5	6	7
37. Ich ziehe es vor, mich so zu verhalten, wie sich alle anderen verhalten	1	2	3	4	5	6	7

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Weder-noch	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
38. Wenn andere etwas tun, das mich interessiert, denke ich daran, es auch zu tun	1	2	3	4	5	6	7
39. Ich vergleiche mich nicht mit anderen Menschen*	1	2	3	4	5	6	7
40. Ich schaue bei anderen nicht zu, um neue Dinge zu lernen*	1	2	3	4	5	6	7
41. Ich nehme gerne an Wettbewerben teil	1	2	3	4	5	6	7

Appendix E

Grandiose Narcissism Scale

Im Folgenden finden Sie 33 Aussagen. Ihre Aufgabe ist, zu entscheiden, inwieweit Sie diese von 1 (stimme überhaupt nicht zu) bis 6 (stimme voll und ganz zu) zustimmen.

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
01. Ich verlasse mich nicht auf andere, um Sachen zu erledigen	1	2	3	4	5	6
02. Falls ich jemanden bevorzugen muss, um zu bekommen, was ich will, so sei es denn	1	2	3	4	5	6
03. Wenn etwas erledigt werden muss, mache ich das selber	1	2	3	4	5	6

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
04. Ich erwarte überdurchschnittlich behandelt zu werden, als der Durchschnitt	1	2	3	4	5	6
05. Ich versuche, möglichst attraktiv auszusehen, wenn ich das Haus verlasse	1	2	3	4	5	6
06. Ich tue Sachen, um Aufmerksamkeit zu erregen	1	2	3	4	5	6
07. Ich bringe mich ins Zentrum der Aufmerksamkeit	1	2	3	4	5	6
08. Ich bin besser in den meisten Sachen, als andere Menschen	1	2	3	4	5	6
09. Ich kann ziemlich manipulativ sein	1	2	3	4	5	6

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
10. Ich bin bereit, andere zu manipulieren, um zu bekommen was ich will	1	2	3	4	5	6
11. Ich mag nicht darauf angewiesen sein, ob andere Menschen etwas tun	1	2	3	4	5	6
12. Ich bin kompetenter als die meisten anderen Menschen	1	2	3	4	5	6
13. Gut auszusehen ist wichtig, um sich gut zu fühlen	1	2	3	4	5	6
14. Mein Aussehen ist mir wichtig	1	2	3	4	5	6
15. Wenn es um mich und eine andere Person geht, gewinne ich fast immer	1	2	3	4	5	6

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
16. Ich tue Dinge, die die Menschen dazu bringen, mich zu bemerken	1	2	3	4	5	6
17. Ich mag Verantwortung für Sachen übernehmen	1	2	3	4	5	6
18. Wenn es darum geht, wie ich von anderen behandelt werde, habe ich höhere Ansprüche als die meisten anderen Menschen	1	2	3	4	5	6
19. Ich verdiene mehr vom Leben als andere Menschen	1	2	3	4	5	6
20. Ich bin talentierter, als die meisten Menschen	1	2	3	4	5	6

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
21. Ich werde alles machen, um voranzukommen, auch wenn es bedeutet, dass andere Menschen verletzt werden	1	2	3	4	5	6
22. Ich führe eher als ich folge	1	2	3	4	5	6
23. Ich kümmere mich darum, wie gut ich aussehe	1	2	3	4	5	6
24. Ich bin irritiert, wenn ich auf andere Menschen angewiesen bin	1	2	3	4	5	6
25. Ich bin bekannt dafür, Menschen auszunutzen, um zu bekommen, was ich will	1	2	3	4	5	6
26. Ich bin eine Person, die aktiv Verantwortung übernimmt	1	2	3	4	5	6

	Stimme überhaupt nicht zu	Stimme nicht zu	Stimme eher nicht zu	Stimme eher zu	Stimme zu	Stimme voll und ganz zu
27. Ich tue Dinge, um die Aufmerksamkeit der Menschen zu erregen	1	2	3	4	5	6
28. Ich denke, es ist wichtig, möglichst gut auszusehen	1	2	3	4	5	6
29. Ich mag Sachen auf eigene Faust tun	1	2	3	4	5	6
30. Ich kann ein Angeber sein	1	2	3	4	5	6
31. Ich bin von Natur aus ein Anführer	1	2	3	4	5	6
32. Es entspricht meinem Naturell, die Führungsrolle in Situationen zu übernehmen	1	2	3	4	5	6
33. Ich verdiene zu bekommen, was ich will	1	2	3	4	5	6

Appendix F

Perceived Stress Questionnaire

In den folgenden Fragen finden Sie eine Reihe von Feststellungen. Bitte lesen Sie jede Feststellung durch und wählen Sie aus den vier Antworten diejenige aus, die angibt, wie häufig die Feststellung auf Ihr Leben in den letzten 4 Wochen zutrifft. Kreuzen Sie bitte bei jeder Feststellung das Feld unter der von Ihnen gewählten Antwort an. Es gibt keine richtigen oder falschen Antworten. Überlegen Sie bitte nicht lange.

	fast nie	**manchmal**	**häufig**	**meistens**
	1	**2**	**3**	**4**
01. Sie fühlen sich ausgeruht				
02. Sie haben das Gefühl, dass zu viele Forderungen an Sie gestellt werden				
03. Sie sind gereizt oder grantig				
04. Sie haben zuviel zu tun				
05. Sie fühlen sich einsam oder isoliert				
06. Sie befinden sich in Konfliktsituationen				

	fast nie	**manchmal**	**häufig**	**meistens**
	1	**2**	**3**	**4**
07. Sie haben das Gefühl, Dinge zu tun, die Sie wirklich mögen				
08. Sie fühlen sich müde				
09. Sie fürchten, Ihre Ziele nicht erreichen zu können				
10. Sie fühlen sich ruhig				
11. Sie müssen zu viele Entscheidungen treffen				
12. Sie fühlen sich frustriert				
13. Sie sind voller Energie				
14. Mein Aussehen ist mir wichtig				
15. Ihre Probleme scheinen sich aufzutürmen				
16. Sie fühlen sich gehetzt				
17. Ich mag Verantwortung für Sachen übernehmen				

	fast nie	manchmal	häufig	meistens
	1	2	3	4
18. Sie haben viele Sorgen				
19. Sie fühlen sich von anderen unter Druck gesetzt				
20. Sie fühlen sich entmutigt				
21. Sie haben Spass				
22. Sie haben Angst vor der Zukunft				
23. Sie haben das Gefühl, Dinge zu tun, weil Sie sie tun müssen und nicht, weil Sie sie tun wollen				
24. Sie fühlen sich kritisiert oder bewertet				
25. Sie sind leichten Herzens				
26. Ich bin eine Person, die aktiv Verantwortung übernimmt				
27. Sie haben Probleme, sich zu entspannen				

	fast nie	**manchmal**	**häufig**	**meistens**
	1	**2**	**3**	**4**
28. Sie fühlen sich mit Verantwortung überladen				
29. Sie haben genug Zeit für sich				
30. Sie fühlen sich unter Termindruck				

Appendix G

Introduction of the Matrix Paradigm

Fast geschafft!

Vielen Dank fürs Ausfüllen.

Im Raum sehen Sie zwei Kisten Bitte geben Sie die Fragebögen in die erste Kiste.

Als Dankeschön folgt jetzt ein Bonusspiel, wo Sie extra Geld gewinnen können. Bitte warten Sie bis die anderen Teilnehmer:innen auch fertig sind.

Einführung ins Bonusspiel

Vor Ihnen befinden sich 2 Umschläge.

Der **blaue Umschlag** enthält €10, der Maximalbetrag, den Sie während dieses Bonusspiels erhalten können.

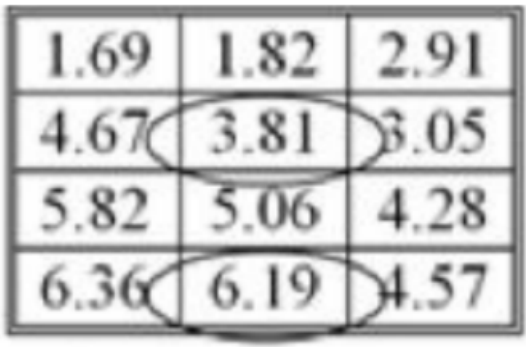
Im **weißen Umschlag** finden Sie zwei Blatt Papier. Auf dem ersten Blatt befindet sich das Spiel, das zweite Blatt beinhaltet die Instruktionen des Spiels.

Appendix H

Instruction for the Matrix Paradigm

Unterhalb sehen Sie eine Matrix, die 12 Zahlen enthält. Es gibt 2 Zahlen (ein Paar), die sich beim Addieren gleich 10 ergeben. Bei dieser Beispielsmatrix sind diese Zahlen (3.81 + 6.19 = 10) eingekreist.

Beispiel



Auf der nächsten Seite werden Sie 20 solche Matrizen sehen. Die Aufgabe wird dieselbe sein: Finden Sie in jeder Matrix das Paar, das sich beim Addieren gleich 10 ergibt.

Achtung: In allen Matrizen gibt es nur ein Paar zu finden. Bitte **kreisen Sie das Paar ein, das Sie gefunden haben**. Sie haben dafür **5 Minuten**. Das Ende des Zeitlimits wird angekündigt.

Danach zählen Sie bitte die Paare, die Sie gefunden haben, zusammen. **Pro gefundenem Paar können Sie 0.50 € von dem blauen Umschlag behalten.** Durchschnittlich finden 6 von 12 Menschen alle Matrix-Paare unter diesem Zeitlimit.

Bitte geben Sie den **Restbetrag und die Bögen in den weißen Umschlag und werfen Sie in die zweite Kiste.**

Appendix I

The Matrix

Blatt 2:	Das Spiel											
1,69	1,82	2,91	5,82	2,91	3,91	0,49	0,74	1,17	0,47	4,58	2,57
4,67	4,81	3,05	3,36	1,54	1,32	3,72	2.00	1,22	3,15	3,82	4,38
5,82	5,06	4,28	6,45	5,27	6,83	3,75	5,22	5,67	4,94	5,42	5,98
6,36	5,19	4,57	0,64	7,29	4,18	8,83	8,23	7,7	2,95	4,86	7,54
2,36	4,27	4,51	9,36	7,79	3,11	0,17	2,46	2,44	0,46	1,98	2,38
4,65	2,24	1,79	6,03	9,84	7,40	6,02	5,6	2,63	0,48	1,79	2,48
2,09	5,35	5,94	0,46	3,82	8,45	6,05	6,21	6,6	0,58	1,69	2,59
5,06	0,64	4,82	7,71	2,21	8,17	8,22	8,19	7,54	1,65	0,98	2,94
0,06	5,07	5,39	0,85	1,62	1,63	0,15	0,95	1,31	0,2	2,54	2,8
1,71	0,03	8,98	6,06	5,63	1,69	4,98	2,9	2,88	1,05	2,39	2,96
2,1	4,96	9,42	6,25	5,01	1,78	6,66	6,73	7,67	1,44	2,28	3.00
4,53	4,65	9,92	6,36	3,16	1,91	9,75	9,85	8,17	1,73	2,19	3,85
0,63	0,65	1,02	0,14	0,15	0,32	0,84	1,54	7,28	0,77	1,47	1,69
2,64	2,34	2,12	5,51	5,68	0,52	4,42	3,54	7,18	3,38	3,18	2,28
2,89	5,98	8,89	5,48	6,15	0,84	5,54	4,78	5,55	3,62	3,01	2,48
9,49	9,37	9,33	5,28	3,31	1,17	6,99	6,93	6,76	3,68	2,93	2,53
0,62	0,74	2,23	0,12	0,71	0,74	0,74	1,93	2,76	0,14	0,67	2,22
8,05	7,68	3,71	4,27	3,07	2,27	7,24	5,03	3,14	5,96	5,58	5,22
8,31	7,06	4,52	5,09	5,73	5,82	7,71	6,38	3,8	7,04	7,59	9,33
8,45	6,44	5,29	9,27	7,03	6,79	8,28	9,18	9,48	9,77	9,5	8,52