Tell a tall tale and watch a narcissist fail:

Narcissism and lie detection via email

Sasha Zarins

Sara Konrath

University of Michigan

Manuscript Word Count: 10,445; Author Note: 26; Body: 8340

Abstract

People are bad at detecting lies, tending to perform just above chance. There is little previous literature on whether individual traits are associated with better lie detection abilities. No research that we know of looks at the association between narcissistic traits and lie detection ability. However, some work has found that narcissistic people are better at detecting emotions in face to face interactions. In this paper, we examine the relationship between narcissism and lie detection ability across two studies. The first study examines the association between narcissism and lie detection ability in emails. People who scored high in narcissism preformed significantly worse in the email lie detection task, but they were significantly more confident in their abilities to detect the lies. This means that narcissistic people are erroneously confident in their lie detection abilities. The second study aimed to replicate the findings of the first study. Additionally, the second study added a video-taped lie detection task. We were not able to replicate the findings of the first study. We also found no associations between narcissism and lie detection abilities in video-taped interactions.

Abstract Word Count: 182

Keywords: narcissism; deception; lie detection; overconfidence; email communication; emotion recognition

Introduction

Lie detection is the ability to determine if a person is telling a lie. A person can tell a lie verbally or they can tell a lie in writing, such as in letters, text messages, or emails. Most research on lie detection has focused on spoken lies. People are generally bad at detecting lies in face-to-face interactions, and perform just above chance around 57% (Kraut, 1980).

A large number of studies have been done to determine discernible dues to deception (see DePaulo et al, 2003, for a meta-analysis). Deception cues fall into five categories: liars are less forthcoming than truth tellers (e.g. spend less time talking), liars tell less convincing stories than truth tellers (e.g. whether details make sense), liars are less positive and pleasant than truth tellers (e.g. smile less), liars are tenser than truth tellers (e.g. restless foot movements, fidgeting hands), and liars include fewer ordinary imperfections (e.g. spontaneous corrections, admissions of memory lapses) and fewer unusual contents (e.g. tangential comments) than truth tellers (DePaulo, et al., 2003). Many of these cues are visual, but a few are verbal, meaning that deception detection is still possible without visual cues.

In terms of visual cues, micro expressions are one of the most important physical indicators of deception (Ekman & Freisen, 1969). Micro expressions are the extremely quick facial expressions that are not immediately noticed by the human eye, but when digitally slowed, convey emotions. People's micro expressions often contradict their lies. By tuning into these micro expressions, one can identify contradictory emotions and determine a lie. Individuals who correctly identify deceit the most tend to focus on more nonverbal cues than verbal ones (Ekman & O'Sullivan, 1991). Taken together, this suggests that the ability to accurately detect deception is directly related to both visual and verbal cues.

However, a recent study done by the United States Government Accountability Office (GAO) reviewed four meta-analyses that examined the helpfulness of behavioral indicators on deception detection. They also reviewed the effectiveness of the Transportation Security Administration's (TSA) Screening of Passengers by Observation Techniques (SPOT) program. The methods used to collect data by the TSA on the SPOT program have been inconsistent and have not shown strong evidence in favor of the use of behavioral indicators to identify security threats. They concluded that because the results of the meta-analyses showed that accuracy rates were at or slightly above chance combined with the inconsistencies in the methods used by the TSA to examine the SPOT program, the TSA should limit funding for the SPOT program and other behavior detection activities. It is important to note that the United States Department of Homeland Security did not agree with the GAO's findings (Government Accountability Office, 2013). Along the same lines, a recent review of deception literature found that although there are some clues that help in detecting lies, these clues are not exclusive to deception (Frank, Menasco, & O'Sullivan, 2014). Nonetheless, this information is inconclusive and highlights the need for additional research on deception detection.

Rates of lying and lie detection depend on communication modes. Recently, society has been moving towards more remote types of communication in which everything can be done on computers and other electronic technologies. This, of course, means written forms of communication like email are becoming increasingly common, which removes visual cues from communication interactions. Email and the internet are viewed as more anonymous and protected, which suggests that people may feel more secure about lying through them. A recent study tested this hypothesis (Naquin, Kurtzberg, & Belkin, 2010). The researchers compared truthfulness in participants in an email condition versus a pen-and-paper condition. Both groups

played the dictator ultimatum game, in which they would divide $89 between themselves and a "partner." Participants next had to let their partners know how much they gave, either via email or on paper. Participants were significantly more likely to lie (92%) about the amount they were giving in the email condition compared to when writing the number down on paper (64%), confirming the anonymity benefit (Naquin, Kurtzberg, & Belkin, 2010). Another study compared email rates of lying to three other communication modes: telephone, instant messaging, and face-to-face. It found that telephone conversations contained the most lies (37%), then face-to-face conversations (27%), instant messaging (21%), and then emails (14%; Hancock, Thom-Santelli, & Ritchie, 2004). Overall, when it comes to rates of lying, there are inconsistencies with respect to whether people lie more or less in emails compared to other communication modes. These differences may be explained by different study methodologies and participants. However, it is clear that there are striking differences in rates of lying depending on which mode is used.

Rates of *lie detection* also depend on communication modes. Research suggests that lies that are written down may be more difficult to detect (e.g. Tornqvist, 2002). Yet it is still possible to identify written lies. For example, one study determined features that discriminated deceitful written narratives compared to truthful written narratives (Schafer, 2007). The researchers found that lies were significantly shorter in length, used more spontaneous negation (e.g. discussing things that were *not* done rather than were done), and used more grammatical structures that allowed for withholding information. For example, words such as "then" in the following sentence, called *text bridges*, are more common in lies than in truthful narratives: "*I got up, and then I took a shower, and then I ate breakfast.*" Such bridges can conceal deception in between the mentioned events. Studies such as this one suggest that it is still possible to detect lies when visual communication is not possible.

Researchers have wondered if the same rules of deception apply to email as they do to other forms of written communications. One study compared people's ability to detect lies in audio messages, written transcripts of audio messages, word processed messages, and email messages (Tornqvist, 2002). It found an overall mean accuracy level of 58% among the four modalities, which is statistically significantly above chance, and which parallels the findings for face-to-face communications (i.e. 57%; Kraut, 1980). However, the modality significantly affected participants' accuracy rates. Although people detected lies in all four modes at rates that were significantly above chance, lies in emails (54.5% accuracy) were the second most difficult to detect, closely following lies in word processed documents (54.0%). Transcripts were the easiest modality to detect lies (66.0%) followed by audio (60.5%; Tornqvist, 2002).

Individual differences in lie detection. Because this topic has high practical relevance, a lot of research has been conducted to examine whether certain people are better at lie detection than others (see Bond & DePaulo, 2008, for a meta-analysis). There are two forms of individual differences that are important to consider in this domain. First, characteristics of the *deceiver* are important. Certain deceivers might be more or less "readable" in terms of cues given in their lies. Overall, the only consistent individual differences that make some liars more or less easy to detect is their perceived credibility; people who are seen as credible are more successful at telling lies (Bond & DePaulo, 2008). Second, characteristics of the lie *detector* are also important. Certain lie detectors might be more or less accurate at reading lies. Some research has found that women (62%) are better at detecting lies than men (47%; deTurck, 1991). Yet overall, in a meta-analysis of 115 studies, there were not any reliable individual differences in the ability to detect lies (Bond & DePaulo, 2008).[1]

A more recent study that was not included in this meta-analysis suggests that there is at least one individual difference that predicts better lie detection: interpersonal trust (Carter & Weber, 2010). People high in interpersonal trust assume the best of others; they assume that others will cooperate with them, be honest, and be dependable. Given this, one might expect that high trusters would assume that everyone is telling the truth, and therefore, would have poor lie detection abilities. On the other hand, since high trusters take more social risks by having a default trusting position, this may drive them to invest more time and effort in learning how to identify people who are not trustworthy. In doing so, they may develop expertise in accurate lie detection. Since low trusters have a default suspicious position, they may not have a chance to fully develop their lie detection skills based on actual feedback about their accuracy. Indeed, in this study, high trusters were better at lie detection accuracy for both truths and lies (Carter & Weber, 2010).

Prior research examining individual differences in lie detection has primarily focused on face-to-face modes of communication and has only rarely found individual differences that predict lie detection ability. In the current study we examine two novel individual differences (i.e. the personality traits narcissism and empathy) in a new mode of communication: email.

Narcissism and reading others. Narcissism consists of unrealistically high self-esteem in combination with low empathy (APA, 1994; Konrath, Bushman, & Grove, 2009; Watson, Biderman, & Sawrie, 1994; Watson, Grisham, Trotter, & Biderman, 1984). Not surprisingly then, narcissism is associated with a number of interpersonal problems. Although people scoring high in narcissism ("narcissists") make good first impressions (Paulhus, 1998), narcissists have difficulties maintaining close relationships with others over the long term (Paulhus, 1998; Campbell, Foster, & Finkel, 2002). In addition, when narcissists' egos are threatened they

become hostile and aggressive (Bushman & Baumeister, 1998; Campbell, 1999; Konrath, Bushman, & Campbell, 2006). Men tend to score higher than women on narcissism (Foster, Campbell, & Twenge, 2003).

People who score high in narcissism also tend to self-enhance (see Morf, Horvath, & Torchetti, 2011, for a review). For example, they tend to rate themselves higher than objective ratings in terms of intelligence and attractiveness (Bleske-Rechek, Remiker, & Baker, 2008; Gabriel, Critelli, & Ee, 1994). They also tend to view themselves as better than others and they are less accurate when rating themselves compared to when rating others (John & Robins, 1994). Although research on narcissistic self-enhancement has covered a variety of topics, there has been limited empirical attention addressing the question of narcissists' abilities to read others. This is an important topic to understand because their abilities (or inabilities) to read others may help to explain some of their interpersonal difficulties.

It is likely that people scoring high in narcissism believe that they are good at being able to read others. In fact, one item on the Narcissistic Personality Inventory (Raskin & Terry, 1988), a commonly used measure of narcissism, directly states: "*I can read others like a book.*" But do narcissists actually have a special ability to read others? In the current study, we specifically examine the relationship between narcissism and lie detection ability.

There is mixed evidence about narcissists' ability to read others in general. Some research has examined the relationship between narcissism and interpersonal sensitivity, or the ability to accurately interpret others' intentions and emotions (Ames & Kammrath, 2004). Overall, this research finds that while narcissists predict that they will perform better on tasks involving interpersonal sensitivity, when in reality they do not perform any better than those scoring low in narcissism (Ames & Kammrath, 2004). Other researchers have more carefully

examined the relationship between narcissism and emotion recognition, finding that certain more unhealthy forms of narcissism (e.g. exploitativeness) are associated with the identification of certain emotions (e.g. negative emotions like anger; Konrath, Corneille, Bushman, & Luminet, 2013; Wai & Tiliopoulous, 2012).

Narcissism and lie detection. Yet, to our knowledge, there are no studies that examine the relationship between narcissism and lie detection. Theoretically, narcissism could be associated with advantages or disadvantages in lie detection ability. On the one hand, narcissists might be good at detecting lies because they are motivated to get what they want by manipulating others. This could make them especially attentive to verbal and nonverbal cues that signal deception. As mentioned, there is some evidence that narcissism is associated with an advantage in reading others' facial expressions of emotions, at least for some types of narcissism (Konrath et al, 2013) and for certain types of emotional expressions (Wai & Tiliopoulous, 2012). Therefore, since lie detection could be interpreted as a form of reading others, narcissists may be better at lie detection in general. Also, a recent study examining narcissism and decision-making performance found that when misleading information was presented in a decision making task, participants who scored high in narcissism outperformed participants who scored low in narcissism (Byrne & Worthy, *in press*). Again, since lie detection is a form of decision making, this could indicate that narcissists may be better at detecting lies.

However, lie detection is typically most successful when using specific visual cues (Ekman & O'Sullivan, 1991), and lie detection in emails relies on different types of cues than visual lie detection (Schafer, 2007). Thus, narcissists' advantages in reading others' facial expressions of emotion might not help with lie detection in emails. It is even possible that narcissists may be bad at noticing written lies. This could occur for a variety of reasons. For

example, their excessive focus on themselves might make it difficult for them to notice other people's signals of deception, or perhaps their high confidence could get in the way of their accuracy. For example, there is evidence that they believe they are better at reading others than they actually are (Ames & Kammrath, 2004). Similarly, another study found that psychopathy, a trait that is highly correlated with narcissism (Paulhus & Williams, 2002), was not associated with lie detection abilities (Martin & Leach, 2012; Peace & Sinclair, 2012).

Most importantly, narcissism has been shown to be negatively correlated to interpersonal trust (Miller et al, 2010; Miller et al, 2011; Rhodewalt & Morf, 1995), and interpersonal trust is positively associated with lie detection abilities (Carter & Weber, 2010). It is therefore possible that narcissists could have poor lie detection abilities.

Empathy and reading others. In this study we also examine the relationship between empathy and lie detection. Empathy typically involves both emotional and cognitive aspects. Empathic concern, the more emotional one, is the tendency to experience compassion and concern for another person in a difficult situation (Davis, 1983). Perspective taking, the more cognitive one, is the ability to imagine other people's points of view and experiences (Davis, 1983). Empathy is highly correlated with social intelligence and is also significantly negatively related to physical, verbal, and indirect aggression (Batson, Ahmad, & Stocks, 2004; Konrath & Grynberg, 2013). Women tend to score higher than men on both kinds of empathy (see Eisenberg & Lennon, 1983, for a meta-analysis).

Empathy is defined as the tendency to read others emotions and to interpret them (Hoffman, 1977). Therefore, it would be logical that people scoring high in empathy are good at reading others. It has been found that empathy is positively correlated with social intelligence, which is the ability to interpret and adapt to interpersonal situations (Kaukianinen et al., 1999).

Research has also found that empathy is associated with emotional intelligence and can even be considered one component of emotional intelligence (Mayer, Caruso, & Salovey, 2000).

Empathic individuals tend to score consistently higher on tests of emotion recognition (Davis & Kraus, 1997; Hall, Andrzejewski, & Yopchick, 2009). For example, one study showed participants slides of faces expressing one of six basic emotions (happiness, sadness, anger, disgust, fear, or surprise) or a neutral expression and asked them to indicate which of the seven expressions was being shown. They found that emotional empathy was positively correlated with the ability to recognize emotions in facial expressions (Riggio, Tucker, & Coffaro, 1988).

Empathy and lie detection. To our knowledge, no studies have been conducted examining whether dispositional empathy is associated with better lie detection in any communication mode. Given that empathic individuals are better able to read others' emotions, they might also be good at detecting deception in others. Moreover, since empathy is associated with higher interpersonal trust (Joireman, Needham & Cummings, 2001), and since people scoring high in trust can more accurately detect lies (Carter & Weber, 2010), it is possible that empathic individuals have more advanced lie detection skills.

On the other hand, high empathy people may not be better at lie detection. One study looked at people's ability to accurately distinguish between actual expressions of pain and deceptive expressions of pain. They found that empathy scores were not correlated with accuracy in detecting deceptive expressions of pain (Hill & Craig, 2004). So, whether people had high or low empathy made no difference in their ability to recognize whether others were in pain.

It is even possible that empathetic people might have poor lie detection abilities. Empathetic people are more likely to automatically mimic others (Sonnby-Borgstrom, 2002; Sonnby-Borgstrom, Jonsson, Svensson, 2003), and research has found that when people are

randomly assigned to mimic liars, they are less accurate in their lie detection ability compared to when they are not mimicking liars (Stel, van Dijk, & Olivier, 2009). Therefore, taken together it is unclear whether dispositional empathy will be associated with better lie detection abilities.

The current research. There is limited work that looks at the relationship between narcissism, empathy, and *emotion* detection in visual settings (face-to-face or videotaped). However, there is no research that we know of that assesses the relationship between narcissism, empathy, and *lie* detection – in any communication mode. Moreover, no research that we are aware of examines the relationship between empathy, narcissism, and confidence in the ability to detect lies. This research attempted to examine the relationship between narcissism and lie detection ability across two studies. The first study examined the association between narcissism and lie detection ability in emails. The second study aimed to replicate the findings of the first study and added a video-taped lie detection task. Not only will this research add to the growing literature on individual differences and lie detection abilities, but it will have implications in how we communicate within society.

Study 1

In the first study we examined the relationship between narcissism, empathy, and lie detection accuracy and confidence. Participants in this study completed measures of narcissism and empathy, and then completed a lie detection task. The lie detection task consisted of reading a number of emails, judging them as truthful or deceitful, and rating confidence in one's judgments. Based on the literature described above, we did not have a priori predictions about the association between narcissism, empathy, lie detection abilities, and confidence. However, the results of our study will add to both the knowledge of deception detection and the knowledge

of these individual differences. In addition, this work also has implications for the way we communicate electronically and how people evaluate electronic communications.

Methods

Phase 1: Creation of email messages

Two males and two females created the email messages used in the detection phase. All four individuals were Caucasian and their ages ranged from 21-22 years old. They were each asked to create four emails, creating a total of sixteen email stimuli. Each person created one truthful email and one deceitful email about: 1) what they did for their spring vacation, and 2) what they planned to do during the upcoming summer. They were instructed to write these emails to a close friend of the same sex.

The decision to have the Phase 1 participants write emails to friends of the same sex is based on the Communication Accommodation Theory (Coupland, Coupland, Giles, & Henwood, 1988). According to this theory, individual's communication styles will converge when talking to each other. This applies to gender differences in language as well. This means when speaking to a member of the same sex, that gender role will be strongly enforced, whereas in mixed sex dyads, individual styles will converge, leading to less extreme gender differences (Thomson, Murachver, & Green, 2001). They were told they could use this person's name as well as their own name in the emails, but that we would remove any identifying information. They were then instructed to email each of these messages individually to the first author exactly as they would send it to their friend. They were instructed to fill in the subject, just as they would if they were sending to their friend (or to not fill it in if they normally would not), to either proofread or not proofread as they normally would, and to use the same language they would normally, even if

this included profanity. They later indicated to the first author which emails were truthful and which were deceitful. Those were coded as such for the purposes of this study.

After receiving the emails, we removed or changed any identifying information. We changed the names to names that are commonly associated with the gender of the original sender. All of the names of the original senders and the intended recipients were common names in the United States. We changed the *sender* names to John Smith and Sarah Jones and the *recipient* names to David Brown and Jane Williams. Besides names, the only other information that could have been somewhat identifying was locations used within the emails. We changed all home cities to Ann Arbor, MI, and all employment cities to Garden City, MI. Each email was then labeled L1-L8 and T1-T8. L indicated a deceitful email and T indicated a truthful email so that they could be easily referred to throughout our study. Emails are available upon request.

In terms of readability statistics and word count, truths and lies did not differ with respect to Flesch-Kincaid readability, $F(1,14)=0.72$, $p=.41$, Gunning-Fog scores, $F(1,14)=0.58$, $p=.46$, and word count, $F(1,14)=0.38$, $p=.55$. The Flesch-Kincaid readability index measures readability with a formula based on the average number of words per sentence and the average number of syllables per word. The formula produces a score equivalent to the grade level generally required to understand the text. The Gunning-Fog index is also a measure of readability with a formula based on the average number of words per sentence and the number of difficult words. The formula also outputs a reading grade level (Klare, 1974-1975). These effects remain non-significant when controlling for the person who created the truth or lie, $ps>.41$.

Phase 2: Survey creation and distribution

We created our surveys using Qualtrics, an online survey creation program, and recruited participants from Amazon's MTurk.

Participants. 143 individuals accessed the survey. Of these, only 95 people answered our key dependent variable (lie versus truth?) for each of the 16 emails, and thus were retained for analyses. Two additional participants were dropped from analyses, one for a technical difficulty and one because of high familiarity with our research program (completed several prior surveys from our lab). Thus, the final sample was 93 participants (58% female; M age=35.15, SD=12.14; 78% Caucasian).

Predictor variables. First, the participants completed a variety of questionnaires covering a number of traits including empathy and narcissism. Empathy was measured using the widely used and valid Davis (1983) Interpersonal Reactivity Index. We only assessed the Empathic Concern subscale, which measures emotional empathy with 7 statements (e.g. "*I often have tender, concerned feelings for people less fortunate than me*" and "*Sometimes I don't feel very sorry for other people when they are having problems,*" 1=*does not describe me well* to 5=*describes me very well*). Statements were averaged to create an empathic concern scale, with higher numbers meaning higher empathy.

Narcissism was measured using the 40-item Narcissistic Personality Inventory (Raskin & Terry, 1988). This is a forced-choice questionnaire that asks participants to choose which statement within each pair best describes their feelings and beliefs (e.g. "*If I ruled the world it would be a better place*" versus "*The thought of ruling the world frightens the hell out of me*"). Narcissistic statements were scored 1, and then responses were summed to create a narcissism score, with higher numbers meaning higher narcissism.

Covariates. Participants were also asked some questions to rule out the possibility of third variables, which is important to do in this correlational design. Participants reported their gender because past research finds gender differences in narcissism (Foster, Keith, & Twenge,

2003), empathy (Hoffman, 1977), and lie detection (deTurck, 1991). We also wanted to rule out the possibility that more intelligence in general was associated with better lie detection ability. Thus, we asked participants to record their highest level of education (1=less than high school; 10=professional degree, e.g. MD / JD) and participants also completed a brief (5 question) verbal IQ multiple-choice test taken from a validated verbal IQ measure (Nathanson & Paulhus, 2007). Participants were also asked to report how often they had sent and received email the previous day (1=none; 7=every few minutes; α=.47). This was in order to rule out the possibility that high email users were better at email lie detection. Finally, participants reported their current mood states by completing the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). This was to rule out the possibility that people in a good or bad mood would have better lie detection skills.

Dependent measures. Participants read all sixteen emails, presented in random order. Each email was followed by the question: "*Do you think the above email was a truth or a lie*?" We summed all correct responses to create an overall accuracy score. We also calculated the truth bias by subtracting the number of truths participants got correct from the total number of truths they guessed.

After reading each email, participants were also asked: "*How confident are you about your choice?*" (1=very uncertain, 5=very confident). We averaged the confidence scores from all 16 emails to create an average confidence score for each participant.

Results

Descriptive statistics. On average, participants got 8.39 (SD=1.63) emails correct out of the 16 (52.4%). The average Empathic Concern score was 3.74 (SD=0.84) and the average Narcissistic Personality Inventory score was 12.06 (SD=8.07). There were no gender differences

in the accuracy of lie detection, $F(1,89)=.20$, $p=.66$. However, there were gender differences in narcissism and empathy that were consistent with prior research (Foster, Keith, & Twenge, 2003; Hoffman, 1977). On average, males ($M=13.94$, $SD=8.97$) scored marginally higher in narcissism than females ($M=10.87$, $SD=7.20$), $F(1,90)=3.32$, $p=.07$, and males ($M=3.53$, $SD=.85$) scored significantly lower in empathy than females ($M=3.89$, $SD=.82$), $F(1,90)=4.16$, $p=.04$. There was not an association between narcissism and empathic concern ($r=-.114$, $p=.279$). Also, there was not an association between participants' average confidence and the percent of correct responses ($r=.047$, $p=.657$).

Predicting number of correct guesses. A simple regression analysis examined the predictive effects of empathy and narcissism on lie detection accuracy, controlling for the truth bias. Empathic concern, narcissism, and the truth bias were all entered into a regression model predicting lie detection accuracy. We found that empathic concern was not associated with the number of correct responses, $\beta=.09$, $p=.32$. However, narcissism was significantly associated with a lower number of correct responses, $\beta=-.20$, $p=.025$. Not surprisingly, considering how it is calculated, the truth bias is negatively associated with the number of correct responses, $\beta=-.57$, $p<.001$.

Stepwise regression analyses were next used to examine the predictive effects of empathy and narcissism on lie detection accuracy, controlling for potential confounding variables (besides the truth bias). In Step 1, empathic concern, narcissism, and the truth bias score were all entered into the analysis. In Step 2, one of the covariates was added to the model. We ran 5 separate regression analyses, with gender, education, verbal IQ, email frequency, or mood entered as a covariate, to examine whether outcomes would remain when controlling for each of these. We

found that significant results (i.e. for narcissism) remained consistent when controlling for each of these variables, β = -.21 to -.19, ps=.023 to .047.

Predicting feelings of confidence. A simple regression analysis examined the predictive effects of empathy and narcissism on participants' average confidence in their ability to detect lies in emails, again controlling for the truth bias. Overall, empathic concern was not associated with average confidence, β=.09, p=.37. However, narcissism was significantly associated with a higher average confidence, β=.23, p=.03.

Stepwise regression analyses were then next to examine the predictive effects of empathy and narcissism on confidence, controlling for potential confounding variables (besides the truth bias). In Step 1, empathic concern, narcissism, and the truth bias score were all entered into the analysis. In Step 2, one of the covariates was added to the model (i.e. gender, education, verbal IQ, email frequency, or mood). We found that significant results (i.e. for narcissism) remained relatively consistent when controlling for each of these variables, β = .19 to .28, ps=.011 to .060.

We ran a final regression analysis to examine whether the relationship between empathy, narcissism, and lie detection accuracy would remain when controlling for confidence, considering that narcissism is related to more confidence. Empathic concern was still unrelated to lie detection accuracy, β=.07, p=.43. In addition, narcissism was still related to lower lie detection accuracy even when controlling for confidence levels, β=-.25, p=.006. This indicates that the results are not explained by the different confidence levels of high versus low narcissists.

Discussion

This study found that narcissism was significantly associated with lower lie detection ability, yet higher feelings of confidence about that ability. Empathy did not predict either lie detection ability or confidence. The negative association between narcissism and accuracy in the

deception detection task adds to the growing literature on narcissism and social intelligence. It is interesting that narcissism is associated with better performance on emotion recognition tasks that rely on visual cues (Konrath, Corneille, Bushman, & Luminet, 2013), but worse on deception tasks that involve the written word. Although this might be explained in part by the different tasks (i.e. emotion recognition versus lie detection), it might also suggest that high narcissism scorers use visual cues to detect deception rather than verbal ones. Our findings on the positive association between narcissism and feelings of confidence fit with prior research (Ames & Kammrath, 2004), which also finds that high narcissism is associated with more feelings of confidence about social abilities. This makes sense when considering the broader portrait of narcissism that includes a heightened sense of self-esteem, personal greatness, and superiority (APA, 2000; Bushman & Baumeister, 1998, Morf & Rhodewalt, 2001; Baumeister, Bushman, & Campbell, 2000). Each of these traits are related to heightened self-confidence about one's abilities, and at times, self-enhancement (i.e. being more confident than is warranted by reality; John & Robins, 1994). In the current study, we find a marked disconnect between high narcissists' abilities and their self-perceptions.

One strength was that our participants had high motivation since we were able show them their scores on the lie detection task. Also, our sample is more representative of the general population compared to college students, who are commonly used as convenience participants in psychology research. On the other hand, one limitation of this study is that it did not include a visual (face-to-face or video-taped) lie detection task. Therefore, we do not know if our findings are specific to written lies or if it generalizes to all forms of lie detection. Study 2 will address this limitation by including both a video-taped lie detection task as well as the email lie detection task.

People scoring high in narcissism perform significantly worse on detecting deception in emails, but at the same time they have significantly higher confidence in their abilities to detect deception. This disconnect makes sense due to narcissists' frequent self-enhancement, yet this is different from research on narcissism and better emotion recognition ability (Konrath, Corneille, Bushman, & Luminet, 2013). It is possible that the difference between narcissists' abilities in visual settings vs email is due to their reliance on visual cues to manipulate people. Our next study intents to help to clarify this issue.

Study 2

In the second study we hope to not only replicate the findings of the first study, but to examine the relationship between empathy, narcissism, and lie detection accuracy and confidence in a video-taped lie detection task. Participants in this study completed measures of narcissism and empathy, and then completed an email lie detection task and a video-taped lie detection task. The email lie detection task used the same stimuli as Study 1. The video lie detection task consisted of watching a number of videos, judging them as truthful or deceitful, and rating their confidence in their judgments. Based on the first study and the literature described above, we had the following a priori predictions about the association between narcissism, lie detection abilities, and confidence: (1) higher scores on the Narcisistic Personality Inventory (NPI) will be associated with lower scores on the email lie detection task, but either higher scores on the video lie detection task or no relation between narcissism and video lie detection abilities and (2) higher scores on the NPI will be associated with higher confidence on both the video lie detection task and the email lie detection task. We had no a priori predictions about the association between empathy, lie detection abilities, and confidence. However, the results of our study will add to both the knowledge of deception detection and the knowledge of

these individual differences. In addition, this work also has implications for the way we communicate face-to-face and electronically and how people evaluate electronic communications.

Methods

Stimuli. Eight emails were chosen from the original sixteen emails created for study 1. A number of considerations were taken into account when deciding which emails to use. First, we examined the overall accuracy rates for each email from Study 1. We wanted to choose the emails that had accuracy rates close to 50%; this would allow for more variability in accuracy rates between different levels of each individual difference. For example, if the email had an overall accuracy of 85%, people who score high (or low) in a certain trait can only vary by 15%, whereas if the email had an overall accuracy of closer to 50%, group averages can vary by up to 50%. However, this was not our main concern when choosing the emails. We also wanted to include two emails from each original sender and ensure that both emails were not about the same topic. For example, we did not want the truthful and the deceitful email about spring break plans from the same person. This resulted in the following eight emails: T1, L2, L3, T4, L5, T6, T7, and L8.

We used a set of standardized video-taped lie detection stimuli from the *Collaborative Research: Interactive Deception and its Detection through Multimodal Analysis of Interviewer-Interviewee dynamics* (SBE0725685) database (Levine, McCornack, & Park, 2013 and Levine, Kim, Park, & Mikayla, 2007). We requested eight tapes from this database. We asked for short tapes and received tapes that ranged in length from 12 seconds to 41 seconds. We also requested tapes where higher accuracy is possible. Past research has shown that tapes where direct questions were used provided for more variability in accuracy rates (Levine, Shaw, & Shulman,

2010). This variability will allow for a better chance that significant findings can be found when accuracy rates are correlated with measures of individual differences. In terms of length, truths and lies did not differ, F(1,6)=0.004, p=.95. Length also did not differ for truths/lies told by males verse females, F(1,6)=.420, p=.541.

Participants. 99 individuals participated in this study for course credit from the Introductory Psychology Subject Pool at the University of Michigan. Four participants were dropped from the study for failing to answer our key dependent variable (lie versus truth?) for each of the 16 stimuli. Therefore, the final sample was 95 participants (53.7% female; M age=18.6, SD=.900; 75.8% Caucasian).

Predictor variables. Similar to Study 1, the participants completed empathy and narcissism measures as part of a larger questionnaire. Empathy was again measured using the Davis (1983) Interpersonal Reactivity Index. As in Study 1, narcissism was measured using the 40-item Narcissistic Personality Inventory (Raskin & Terry, 1988).

Covariates. Once again, participants were asked questions to rule out the possibility of third variables. Participants reported their gender and also completed a brief (5 question) verbal IQ multiple-choice test taken from a validated verbal IQ measure (Nathanson & Paulhus, 2007). Participants were also asked to report how often they had sent and received email or texts, checked or posted to Twitter or Facebook, used Instagram, or used another type of media the previous day (1=none; 7=more than once every ten minutes). This was in order to rule out the possibility that high email and social media users were better at lie detection. We included social media in addition to email use because it indicates a higher familiarity with online communication. Finally, participants reported their current mood states by indicating how much

they felt 40 different emotions at that moment (1=very slightly; 5=extremely). This was to rule out the possibility that people in a good or bad mood would have better lie detection skills.

Dependent measures: Lie detection. Participants read the eight emails and watched the eight videos. The emails and videos were presented in randomized order and participants were randomized as to whether they saw the videos first or the emails first. Each video was followed by the question: "*Do you think the person in this video is telling the truth or lying?*" and each email was followed by the question: "*Do you think the person who sent this email is telling the truth or lying?*" The wording of the question was changed slightly from the first study which asked: "*Do you think this email was a truth or a lie?*" This change was made due to the addition of the video-taped interaction lie detection task. The question "Do you think this video was a truth or a lie?" does not make sense. An object cannot lie. Unlike an email where the text is assumed to be equivalent to the sender speaking the words, in the video-taped interactions, more than one person was present and speaking.

After reading each email and watching each video, participants were also asked: "*How confident are you about your choice?*" (1=very uncertain, 5=very confident). We averaged the confidence scores from all 8 emails and all 8 videos to create average email and video confidence scores for each participant.

Results

Descriptive statistics. On average, participants got 4.10 (SD=1.12) emails correct out of the 8 (51.2%) and 4.61 (SD=1.27) videos correct out of 8 (57.6%). The average Empathic Concern score was 3.88 (SD=0.66) and the average Narcissistic Personality Inventory score was 16.41 (SD=6.53). There were no gender differences in the accuracy of lie detection for email, $F(1,83)=.53$, $p=.47$, or video, $F(1,83)=.50$, $p=.48$. However, there were gender differences in

narcissism and empathy that were consistent with prior research (Foster, Keith, & Twenge, 2003; Hoffman, 1977). On average, males (M=17.91, SD=6.94) scored marginally higher in narcissism than females (M=15.18, SD=6.40), $F_{(1,87)}$=3.484, p=.065, and males (M=3.47, SD=.63) scored significantly lower in empathy than females (M=4.16, SD=.53), $F_{(1,83)}$=29.43, p<.001. There was not an association between narcissism and empathic concern (r=.036, p=.731). Also, there was not an association between average confidence and percent correct responses for email (r=.075, p=.469) or video (r=.067, p=.516).

Predicting number of correct guesses in the email lie detection task. A simple regression analysis examined the predictive effects of empathy and narcissism on email lie detection accuracy, controlling for the email truth bias. Empathic concern, narcissism, and the email truth bias were all entered into a regression model predicting lie detection accuracy. We found that empathic concern was not associated with the number of correct responses, β=-.04, p=.64, nor was narcissism, β=-.09, p=.26. Not surprisingly, considering how it is calculated, the truth bias is negatively associated with the number of correct responses, β=-.65, p<.001.

Stepwise regression analyses were next used to examine the predictive effects of empathy and narcissism on lie detection accuracy, controlling for potential confounding variables (besides the truth bias). In Step 1, empathic concern, narcissism, and the email truth bias score were all entered into the analysis. In Step 2, one of the covariates was added to the model. We ran 4 separate regression analyses, with gender, verbal IQ, media use, or mood entered as a covariate, to examine whether outcomes would remain when controlling for each of these. The results remained insignificant.

Predicting number of correct guesses in the video lie detection task. A simple regression analysis examined the predictive effects of empathy and narcissism on video lie detection

accuracy, controlling for the video truth bias. Empathic concern, narcissism, and the video truth bias were all entered into a regression model predicting lie detection accuracy. We found that empathic concern was not associated with the number of correct responses, β=-.04, p=.61, nor was narcissism, β=-.02, p=.78. Once again, not surprisingly, considering how it is calculated, the video truth bias is negatively associated with the number of correct responses, β=-.75, p<.001.

Stepwise regression analyses were next used to examine the predictive effects of empathy and narcissism on lie detection accuracy, controlling for potential confounding variables (besides the truth bias). In Step 1, empathic concern, narcissism, and the email truth bias score were all entered into the analysis. In Step 2, one of the covariates was added to the model. We ran 5 separate regression analyses, with gender, verbal IQ, media use, or mood entered as a covariate, to examine whether outcomes would remain when controlling for each of these. The results remained insignificant.

Predicting feelings of confidence in the email lie detection task. A simple regression analysis examined the predictive effects of empathy and narcissism on participants' average confidence in their ability to detect lies in emails, again controlling for the email truth bias. Overall, empathic concern was not associated with average confidence on the email task, β=-.01, p=.91, nor was narcissism, β=.004, p=.97.

Stepwise regression analyses were then next to examine the predictive effects of empathy and narcissism on confidence, controlling for potential confounding variables. In Step 1, empathic concern, narcissism, and email truth bias were entered into the analysis. In Step 2, one of the covariates was added to the model (i.e. gender, verbal IQ, media use, or mood). The results remained insignificant.

We ran a final regression analysis to examine whether the relationship between empathy, narcissism, and lie detection accuracy would remain when controlling for confidence, considering that narcissism is related to more confidence. Empathic concern is still unrelated to lie detection accuracy, β=-.04, p=.65, as is narcissism, β=-.09, p=.26.

Predicting feelings of confidence in the video lie detection task. A simple regression analysis examined the predictive effects of empathy and narcissism on participants' average confidence in their ability to detect lies in videos, again controlling for the video truth bias. Overall, empathic concern was not associated with average confidence on the video task, β=-.16, p=.13. However, narcissism was significantly associated with a higher average confidence, β=.24, p=.02.

Stepwise regression analyses were then next to examine the predictive effects of empathy and narcissism on confidence, controlling for potential confounding variables. In Step 1, empathic concern, narcissism, and truth bias were entered into the analysis. In Step 2, one of the covariates was added to the model (i.e. gender, verbal IQ, media use, or mood). We found that significant results (i.e. for narcissism) remained consistent when controlling for each of these variables, β = .221 to .255, ps=.018 to .035.

We ran a final regression analysis to examine whether the relationship between empathy, narcissism, and lie detection accuracy would remain when controlling for confidence, considering that narcissism is related to more confidence. Empathic concern is still unrelated to lie detection accuracy, β=-.03, p=.67, as is narcissism, β=-.03, p=.70.

Discussion

Unfortunately, we failed to replicate our significant results from Study 1. Once again, empathy did not predict either lie detection ability or confidence in either the email or the video

lie detection task. Narcissism did not predict lie detection ability in the email lie detection task or the video lie detection task.

This study also had some limitations. For example, because of the major differences between the email stimuli and the video stimuli, the two cannot be easily compared in a single analysis. The emails were narratives while the video's included direct question and answer interactions. Therefore, this might introduce a confound into the analysis. However, we do not directly compare the two mediums so this may be a minor issue.

Empathy did not predict either lie detection ability or confidence in either the email or the video lie detection task. Unlike in Study 1, narcissism did not predict lie detection ability in the email lie detection task or the video lie detection task. Narcissism did predict higher levels of confidence on the video lie detection task, but not on the email lie detection task.

General Discussion

One reason that Study 2 may not have replicated the results of Study 1 might be that people who score low in narcissism learn how to detect lies quicker than people who score high in narcissism. The first study had sixteen emails while the second study had only eight emails. It is possible that eight emails did not provide enough evidence for people who scored low in narcissism to learn how to detect the lies. Future research should compare the interaction between narcissism and the number of stimuli and lie detection accuracy. This may also apply to video-taped interactions, but since only one study included the video lie detection task, the same pattern might not exist.

Another difference between the two studies that could account for the failure to replicate is the differences in the populations. Study 1 recruited participants from the general population whereas Study 2 recruited university students. Past research has shown that narcissism has

increased among college students over the past twenty to thirty years (Twenge, Konrath, Foster, Campbell, & Bushman, 2008). While this research cannot determine if this is a generational effect or a time-period effect, if it is a generational effect meaning that older Americans are less narcissistic than younger Americans, it is possible that the high levels of narcissism in the second study are the reason that the results did not replicate.

However, the inconsistency in the results may be significant in itself. In the past, there have not been any consistent findings individual differences in the ability to detect lies (Bond & DePaulo, 2008). This could be further evidence that there are no personality traits that predict better lie detection abilities, but given the abundant research showing differences in abilities between people who score high in narcissism and people who score low in narcissism (e.g. Konrath et al, 2013; Wai & Tiliopoulous, 2012; Byrne & Worthy, *in press*), it is still highly possible that individual differences in lie detection abilities exist, particularly individual differences in levels of narcissism.

Future research could also manipulate goals (self-focused versus other-focused) to better determine whether narcissism is the predictive variable. Similar studies could also be run with individual differences that are correlated with empathy and narcissism such as prosocial behavior or Machiavellianism. Further research could also manipulate confidence by giving the participants false feedback after a lie detection pre-test to see if confidence is associated with lie detection accuracy even though our research found no correlation.

Our studies had a number of strengths. First, they included an actual lie detection test and was able to test real behavior. We used real emails and presented them as they would appear in gmail, a very common email program. Also, the video stimuli used have been validated as part of

a large multi-university study (Levine, Kim, Park, & Mikayla, 2007). We also created an operationalization of the truth bias (number of truths guessed minus number of truths seen).

However, these studies also had some limitations. For example, all of the emails were written by college students and may not apply to older adults and Study 1 included adults of all ages. However, participants' open-ended responses about why they thought the email was a truth or a lie revealed that even adults could relate to the emails through friends or family member experiences. For example, one participant noted that one of the trips "sounds like [her] son's last trip." The second study addressed this limitation and used college students; therefore, there was a match between the stimuli and participant demographics.

One major limitation is that we rely on cross-sectional data, and therefore causal inferences are limited. It is possible that increased narcissism leads to poor lie detection ability, for example, because people scoring high in narcissism believe that they are good at detecting lies and do not receive any information that would indicate otherwise in their day-to-day interactions. The other direction of causality—that poor lie detection ability causes an increase in narcissism—can be ruled out logically. Yet, there may still be third variables that we did not consider that explains why narcissism is associated with poor lie detection (e.g. types of employment that require the frequent use of lie detection might be relatively less common among narcissists). We attempted to address the most obvious ones in this study, yet we still cannot conclude with confidence whether narcissism itself is the cause of poor lie detection abilities.

Implications. Our research adds to the understanding of lie detection. As far as we know, very little research has been done on lie detection in emails. It also adds to the research on internet communication. The use of email and other forms of internet communication (instant messaging, social media) has increased rapidly over the past two decades. Today, it is an

extremely important part of our daily lives. Because of this, our research could have implications where emails are widely used, particularly in the business world or in legal matters. If people with certain personality traits such as narcissism or empathy are better or worse at lie detection in emails, this could have implications during the hiring process where lie detection is especially important. Large portions of the hiring process are commonly occurring online through emails and questionnaires (Cober, et al, 2000). In the legal system, emails are being used as evidence more often in recent years (Weisband & Reining, 1995) and they could have other legal implications where communication is important.

Table 1. Study 1 correlations of empathetic concern and narcissism with number of correct guesses and feelings of confidence

	Number of correct guesses	Feelings of confidence
Overall		
Empathic concern	.09	.09
Narcissism	-.20*	.23*
With covariates		
Empathic concern w/gender	.09	.08
Narcissism w/gender	-.21*	.23*
Empathic concern w/education	.10	.08
Narcissism w/education	-.20*	.22*
Empathic concern w/verbal IQ	.08	.10
Narcissism w/verbal IQ	-.19*	.28*
Empathic concern w/email frequency	.09	.09
Narcissism w/email frequency	-.20*	.23*
Empathic concern w/mood	.14	-.02
Narcissism w/mood	-.19*	.19
Empathic concern w/confidence	.07	-
Narcissism w/confidence	-.25*	-

*p<.05

Table 2. Study 2 correlations of empathetic concern and narcissism with number of correct guesses and feelings of confidence

	Number of correct guesses – Video Task	Feelings of confidence – Video Task	Number of correct guesses – Email Task	Feelings of confidence – Email Task
Overall				
Empathic concern	-.04	-.16	-.04	-.01
Narcissism	-.02	.24*	-.09	.004
With covariates				
Empathic concern w/gender	-.18	-.15	-.15	-.03
Narcissism w/gender	.08	.26*	-.03	.02
Empathic concern w/verbal IQ	-.04	-.16	-.05	-.003
Narcissism w/verbal IQ	-.02	.25*	-.09	.000
Empathic concern w/media use	-.02	-.19	-.03	-.04
Narcissism w/media use	-.01	.22*	-.08	-.02
Empathic concern w/mood	-.07	-.16	-.03	-.02
Narcissism w/mood	-.04	.24*	-.08	.001
Empathic concern w/confidence	-.03	-	-.04	-
Narcissism w/confidence	-.03	-	-.09	-
Empathic concern w/gender, verbal IQ, media use, and mood	-.20	.18	-.15	-.06
Narcissism w/gender, verbal IQ, media use, and mood	.07	-.22*	-.002	-.02

*p<.05

References

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders

    (4th ed.).

Ames, D. R., & Kammrath, L. K. (2004). Mind-Reading and Metacognition: Narcissism, not

    Actual Competence, Predicts Self-Estimated Ability. *Journal of Nonverbal Behavior,*

    28(3), 187-209.

Batson, C. C., Ahmad, N., & Stocks, E. L. (2004). Benefits and libailities of empathy-inuced

    altruism. *The Social Psychology of Good and Evil,* 359-385

Bleske-Rechek, A., Remiker, M. W., & Baker, J. P. (2008). Narcissistic men and women think

    they are so hot – But they are not. *Personality and Individual Differences, 45*, 420-424.

Bond Jr., C. F., & DePaulo, B. M. (2008). Individual differences in judging deception: Accuracy

    and bias. *Psychological Bulletin, 134(4)*, 477-492.

Bushman, B. J., & Baumeister, R. F. (1998). Threatened Egotism, Narcissism, Self-Esteem, and

    Direct and Displaced Aggression: Does Self-Love or Self-Hate Lead to Violence?

    Journal of Personality and Social Psychology, 75(1), 219-229.

Byrne, K. A. & Worthy, D. A. (*in press*). Do narcissists make better decisions? An investigation

    of narcissism and dynaic decision-making performance. *Personality and Individual*

    Differences.

Campbell, W. K. (1999). Narcissism and Romantic Attraction. *Journal of Personality and Social*

    Psychology, 77(6), 1254-1270.

Campbell, W. K., Foster, C. A., & Finckel, E. L. (2002) Does self-love lead to love for others? A

    story of narcissistic game playing. *Journal of Personality and Social Psychology, 83(2),*

    340-354.

Carter, N. L., & Weber, J. M. (2010). Not pollyannas: Higher Generalized trust predicts lie

 detection ability. *Social Psychological and Personality Science, 1(3),* 274-279.

Cober, R. T. et al. (2000). The quest for the qualified job surfer: It's time the public sector

 catches the wave. *Public Personnel Management, 29*(4), 479-496.

Coupland, N., Coupland, J., Giles, H., & Henwood, K. (1988). Accommodating the elderly:

 Invoking and extending a theory. *Language in Society, 17*(1), 1-41.

Davis, M. (1983). Measuring individual differences in empathy: Evidence for a multidimensional

 approach. *Journal of Personality and Social Psychology, 44*(1), 113-126.

Davis, M., & Kraus, L. (1997). Personality and empathic accuracy. In W. Ickes (Ed.), *Empathic*

 accuracy. New York, NY: Guilford Press.

Davis, M., & Kraus, L. (1997). Personality and empathic accuracy. In W. Ickes (Ed.), *Empathic*

 accuracy. New York, NY: Guilford Press.

DePaulo, B. M. et al. (2003) Cues to deception. *Psychological Bulletin 129(1)*, 74-118.

deTurck, M. A. (1991). Training observers to detect spontaneous deception: Effects of gender.

 Communications Reports, 4(2), 81-89.

Eisenberg, N., & Lennon, R. (1983). Sex differences in empathy and related capacities.

 Psychological Bulletin, 94(1), 100-131.

Ekman, P., & Friesen, W. V. (1969). Nonverbal leakage and clues to deception. *Psychiatry:*

 Journal For The Study Of Interpersonal Processes, *32*(1), 88-106.

Ekman, P., & O'Sullivan, M. (1991). Who can catch a liar? *American Psychologist, 46*(9), 913.

Foster, J. D., Campbell, W. K., & Twenge, J. M. (2003). Individual differences in narcissism:

 Inflated self-views across the lifespan and around the world. *Journal of Research in*

 Personality 37, 469-486.

Frank, M. G., Menasco, M. A., & O'Sullivan, M. (2014). Human Behavior and Deception detection. In J. G. Koeller (Eds.), *Social and Behavioral Research for Homeland Security.* Hoboken,NJ: John Wiley & Sons, Inc.

Gabriel, M. T., Critelli, J. W., & Ee, J. S. (1994). Narcissistic illusions in self-evaluations of intelligence and attractiveness. *Journal of Personality 62(1)*, 143-155.

Government Accountability Office. (2013). *Aviation security: TSA should limit future funding for behavior detection activities (GAO Highlights: Highlights of GAO-14-159, a report to congressional requesters).* Washington, DC: U.S. Government Printing Office.

Hall, J., Andrzejewski, S., & Yopchick, J. (2009). Psychosocial Correlates of Interpersonal Sensitivity: A Meta-Analysis. *Journal of Nonverbal Behavior, 33*(3), 149-180. doi: 10.1007/s10919-009-0070-5

Hall, J., Andrzejewski, S., & Yopchick, J. (2009). Psychosocial Correlates of Interpersonal Sensitivity: A Meta-Analysis. *Journal of Nonverbal Behavior, 33*(3), 149-180.

Hancock, J.T., Thom-Santelli, J., & Ritchie, T. (2004). Deception and design: The impact of communication technology on lying behavior. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, 6(1),* 130-136.

Hill, M. L., & Craig, K. D. (2004). Detecting deception in facial expressions of pain: Accuracy and training. *Clin J Pain, 20*, 415-422.

Hoffman, M. L. (1977). Sex differences in empathy and related behaviors. *Psychological Bulletin, 84(4)*, 712-722.

John, O. P., & Robins, R. W. (1994). Accuracy and bias in self-perception: Individual differences in self-enhancement and the role of narcissism. *Journal of Personality and Social Psychology, 66(1)*, 206-219.

Joireman, J. A., Needham, T. L., & Cummings, A. L. (2001). Relationships between dimensions of attachment and empathy. *North American Journal of Psychology 3(3),* 63-80.

Kaukiainen, A. et al. (1999). The relationships between social intelligence, empathy, and three types of aggression. *Aggressive Behavior, 25*, 81-89.

Klare, G. R. (1974-1975). Assessing readability. *Reading Research Quarterly, 10*(1), 62-102.

Konrath, S., Bushman, B., & Campbell, W. K. (2006). Attenuating the link between threatened egotism and aggression. *Psychol Sci, 17*(11), 995-1001. doi: PSCI1818 [pii]10.1111/j.1467-9280.2006.01818.x

Konrath, S., Bushman, B., & Grove, T. (2009). Seeing my world in a million little pieces: narcissism, self-construal, and cognitive-perceptual style. *Journal of Personality, 77*(4), 1197-1228.

Konrath, S., Corneille, O., Bushman, B. J., & Luminet, O. (2013). Can narcissists "read people like a book?" The relationship between narcissistic exploitativeness and emotion recognition abilities. *In review.*

Konrath, S., & Grynberg, D. (2013). The positive (and negative) psychology of empathy. Watt, D. & Panksepp, J. (Eds) *The Neurobiology and Psychology of Empathy,* Nova Science Publishers, Inc. *In press.*

Kraut, R. (1980). Humans as lie detectors: Some second thoughts. *Journal of communication, 30(4)*, 209-218.

Levine, T. R. (2010) A few transparent liars. In C Salmon (Eds.) *Communication Yearbook 34.* Sage.

Levine, T. T., McCornack, S. A., & Park, H. S. (2013). "Current NSF sponsored research." *Deception Research at Michigan State University.* Michigan State University. Retrieved

from https://www.msu.edu/~levinet/deception.htm

Levine, T. R., Shaw, A., & Shulman, H. C. (2010). Increasing deception detection accuracy with

strategic questioning. *Human Communication Research, 36,* 216-231.

Martin, K., & Leach, A. M. (2012). Psychopathy and deception detection. *Personality and*

Mental Health.

Mayer, J. D., Caruso, D. R., & Salovey, P. (2000). Selecting a measure of emotional intelligence:

The case for ability scales. *The handbook of emotional intelligence: Theory development,*

assessment, and application at home, school, and in the workplace. BarOn, R., & Parker,

D. A. (Eds). 320-342.

Miller, J. D. et al. (2010). Searching for a vulnerable dark triad: Comparing factor 2

psychopathology, vulnerable narcissism, and borderline personality disorder. *Journal of*

Personality, 78(5), 1529-1564.

Miller, J. D. et al. (2011). Grandiose and vulnerable narcissism: A nomological network analysis.

Journal of Personality, 79(5), 1013-1042.

Morf, C. C., Horvath, S., Torchetti, L. (2001) Narcissistic self-enhancement: Tales of

(successful?) self-portrayal. *Handbook of Self-Enhancement and Self-Protection*. Alicke,

M. D., & Sedikides, C. (eds). 399-424.

Naquin, C. E., Kurtzberg, T. R., & Belkin, L. Y. (2010). The finer points of lying online: E-mail

versus pen and paper. *Journal Of Applied Psychology, 95*(2), 387-394.

Nathanson, C., & Paulhus, D.L. (2007, June). *Validation of the UBC Word test*. Poster

presented at the meeting of the Canadian Psychological Association, Toronto.

Paulhus, D. L. (1998). Interpersonal and intrapsychic adaptiveness of trait self-enhancement: A

mixed blessing? *Journal of Personality and Social Psychology, 74(5),* 1197-1208.

Paulhus, D. L., & Williams, K. M. (2002). The Dark Triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality, 36*(6), 556-563.

Peace, K. A., & Sinclair, S. M. (2012). Cold-blooded lie catchers? An investigation of psychopathy, emotional processing, and deception detection. *Legal and Criminological Psychology, 17(1),* 177-191.

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.

Rhodewalt, F. & Morf, C. C. (1995). Self and interpersonal correlates of the narcissistic personality inventory: A review and new findings. *Journal of Research in Personality 29,* 1-23.

Riggio, R. E., Tucker, J., & Coffaro, D. (1989). Social skills and empathy. *Personality and Individual Differences, 10*(1), 93-99.

Schafer, J., R. (2007). Grammatical differences between truthful and deceptive written narratives. (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses. (AAI3296068).

Sonnby-Borgstrom, M. (2002). Automatic mimicry reactions as related to differences in emotional empathy. *Scandinavian Journal of Psychology, 43*, 433-443.

Sonnby-Borgstrom, M., Jonsson, P., & Svensson, W. (2003). Emotional empathy as related to mimicry reactions at different levels of information processing. *Journal of Nonverbal Behavior, 27(1)*, 3-23.

Stel, M., van Dijk, E., & Olivier, E. (2009). You want to know the truth? Then don't mimic! *Psychological Science, 20*, 693-699.

Thomson, R., Murachver, T., & Green, J. (2001). Where is the gender in gendered language? *Psychological Science, 12*(2), 171-175.

Tornqvist, J.S. (2002). The detectability and believability of lies and truths in the e-mail medium. (Ph.D. dissertation). Retrieved from ProQuest Dissertations and Theses. (AAT3030692).

Twenge, J. M., Konrath, S., Foster, J. D., Campbell, W. K., & Bushman, B. J. (2008). Egos inflating over time: A cross-temporal meta-analysis of the narcissistic personality inventory. *Journal of Personality, 76*(4), 876-901.

Wai, M., & Tiliopoulos, N. (2012). The affective and cognitive empathic nature of the dark triad of personality. *Personality and Individual Differences, 52*(7), 794-799.

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070.

Watson, P. J., Biderman, M. D., & Sawrie, S. M. (1994). Empathy, sex role orientation, and narcissism. *Sex Roles, 30*(8-9), 701-723.

Watson, P. J., Grisham, S. O., Trotter, M. v., & Biderman, M. D. (1984). Narcissism and empathy: Validity evidence for the Narcissistic personality inventory. *Journal of Personality Assessment, 48*(3), 301-305.

Weisband, S. P., & Reinig, B. A. (1995). Managing user perceptions of email privacy. *Communications of the ACM, 38*(12), 40-47.

Endnotes

---

[1] Note that Bond & DePaulo's (2008) meta-analysis did not examine gender.