Catching Liars in Psychological Evaluations of Criminal Defendants: Comparing Direct vs. Indirect Assessment of Truthfulness

Shawn Adair Johnston', Gabriel Johnston, Alexis Candelier and Dana Powers-Green

Department of Psychology, Portland State University, Portland, USA

Abstract

This research examines the two-fold question of why people are so poor at detecting deception and why the indirect assessment of veracity may be more accurate than direct assessment. Four statements made by criminal defendants, two true and two deceptive, were rated by participants on a nine item test of veracity. Eight of the items were derived from Criterion-Based Content Analysis and Reality Monitoring, two techniques of verbal content analysis that exhibit good reliability. Scores on these eight items represented the indirect measure of truthfulness while a ninth item, the direct measure, asked participants to rate the overall truthfulness of each statement. Results indicated that the indirect assessment of truthfulness accurately classified a higher percentage of the statements made by the criminal defendants than the direct assessment while also accounting for more of the variance in the rating. The superior accuracy of indirect assessment overwhelmingly relies on a single variable of realism while largely failing to use the seven other items, while indirect assessment utilizes all eight items approximately equally. The results also suggest that a one-step cognitive process is used in determining that a statement is true but that a two-step process is used in determining a statement is deceptive. These results support the idea that people are poor at detecting deception because identifying a statement as deceptive literally requires more cognitive effort than assuming veracity. Indirect assessment is more reliable since it permits the use of multiple sources of information rather than relying on a single attribute.

Keywords: Psychology • Criminal justice • Deception detection • Sex offenders • Insanity • Assessment • Truthfulness • Malingering

Introduction

A number of surprising findings have emerged from the attempt to design a scientifically-based technique for deception detection. Considerable research indicates, for example, that people are generally very poor at detecting deception, perhaps doing so around chance levels or around 50% [1-8]. In their 2006 meta-analysis of the relevant research literature, Bond and DePaulo found that the overall ability to differentiate between true and deceptive statements was 54% with the accurate identification of true statements achieving 61% and the accurate identification of deceptive statements achieving only 47%. Such findings indicate that most people in most situations judge the statements of most other persons as truthful giving rise to the idea of a truth bias in interpersonal deception detection. Poor accuracy in deception detection includes the general public, police officers, judges, juries, and psychologists. Contrary to expectation, all of these groups perform equally poorly at detecting deception and even individual differences, including age, gender, education, law enforcement experience, and confidence are all unrelated to the ability to detect deception. This robust finding was demonstrated across 108 studies [9], though research by Vrij [10], Hartwig, Granhag, Stromwall and vrij [11,12] suggests an interesting caveat with regard to the reasons for which police officers deception detection accuracy may be so poor. Unsurprisingly, these latter studies suggest that police officers investigating criminal suspects exhibit a

*Address for Correspondence : Shawn Adair Johnston, Department of Psychology, Portland State University, Portland, USA; Tel: 5033444429; E-mail: shawnjohnstonphd@comcast.net.

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"lie" or deception bias rather than truth bias. Quite interestingly, it may be that police officers exhibit no better ability at detecting liars than does the general public because they presume most suspects lie, suggesting that the ability to accurately determine truthful statements is just as important as accurately identifying deceptive ones.

Considerable research has found that what a person says may be more reliable at detecting deception than how they say it. This suggests that the content of verbal statements may be substantially more reliable than non-verbal cues at differentiating between true and deceptive statements [7,10,13,14]. In both Vrij [10] study and in Littlepage and Pineault's study [15], the results showed that observers are better able to distinguish between true and deceptive statements when they pay attention to verbal information than when they pay attention to non-verbal information.

Particularly surprising is the finding that the indirect assessment of truthfulness may be more accurate than its direct, also called subjective and intuitive, assessment. A compelling number of studies and literature reviews have specifically tested the relative efficacy of direct measures over indirect measures in detecting deception and found the indirect measures to be significantly more successful [12,16-20]. The direct methods asked the participant to judge deception directly (i.e., "Is this person lying or telling the truth?"), while the indirect methods asked the participant to consider variables of deception. All the listed studies, as well as a literature review by DePaulo and Morris [21], found greater accuracy through indirect assessment. Interestingly, the participants in two of these studies were able to detect deception above the level of chance only if they were using indirect assessment [16,17].

Social psychology literature finds comparable accuracy in detecting deception with indirect measures [16,22]. Anderson's study [22] found that ratings of indirect cues related to truthfulness were more accurate than direct ratings of truthfulness when an individual is assessed by both

their heterosexual partner and a stranger. In the research, a challenge to the superiority of indirect measures over direct measures was raised regarding the use of continuous indirect measures (i.e., the research subject rates an attribute selecting from multiple response options such as high, medium and low) versus dichotomous direct measures (i.e., the research subjects rates the attribute as being either present or absent, true or false, black or white, etc.), creating a possible difference due to measurement sensitivity. Specifically, a study tracing deception detection by both friends and strangers across the development of a friendship (i.e. a truth or lie was told to a same-sex friend) utilized both dichotomous and continuous direct measures to assess truthfulness and found significantly greater accuracy with the continuous measure. In fact, the dichotomous measure did not increase accuracy above chance level [16]. As Anderson [22], pointed out; studies utilizing the same type of scale for both direct and indirect assessment have supported greater accuracy of continuous indirect measures in comparison to continuous direct measures [17,18].

Direct judgments of veracity tend to rely on common knowledge cues of deception detection, rather than empirically-demonstrated cues [16]. Direct judgments also fail to demonstrate test-retest reliability, both in experimentally-manipulated and naturalistic contexts [23]. As Leach points out, the lack of reliability means that experience and training do not always improve accuracy of intuitive deception detection [24,25]. In fact, several studies indicate that training of individuals does not tend to improve accuracy [26]. All of these findings suggest that reliable assessments of truthfulness require an objective measure as opposed to training of intuitive deception detection.

In light of this, Johnston et al. [27] created an 8-item indirect test of truthfulness, the Forensic Assessment of Client Truthfulness (FACT), which was derived from the overlapping content of the items from Criterion-Based Content Analysis (CBCA) and Reality Monitoring (RM). The FACT test was more accurate in differentiating between true and deceptive statements of criminal defendants than ratings based on the direct assessment of truthfulness. Both the indirect and direct assessments were formatted identically on a 5-point rating scale to ensure that measurement characteristics did not account for any potential difference in accuracy. The fact that such widely different methods of indirect assessment raises at least two interesting questions: why are people so bad at catching liars and what is the psychological process that appears to make the indirect assessment?

Perhaps the most obvious reason for why we are so poor at identifying lies is the result of the so-called "truth bias". The "truth bias" is the tendency to evaluate what other people say as true [28-31] which may result from the fact that the majority of things people say to each other are true [7,10]. While deception in nature and human relationships is ubiquitous [14], it is difficult to imagine that civilization would even be possible if most of our interactions did not involve truthful or honest exchanges.

The potentially severe social psychological consequences of labeling someone a liar may also account for some of the difficulty in detecting deception. Indeed, Pinker [32] points out that calling someone a liar, up until only about 150 years ago in both Europe and America, could have easily resulted in a challenge to duel with potentially fatal consequences. Calling someone a liar remains one of the foremost expressions of disrespect one person can show another.

Lastly, determining that a statement is false requires significant cognitive effort. Detecting deception can be very difficult, especially when the wouldbe deceiver is a skillful and motivated liar. With regard to successful deception detection, one of the most important theories to emerge is that of cognitive load or content complexity. This theory posits that telling an effective lie is cognitively challenging. The liar must be sure the target of his deception is unaware of the truth, that the lie is plausible, internally consistent, easy to remember and repeat, and difficult to easily disconfirm [7,10,33]. In further support found that accuracy of deception detection was Johnston, et al. [35] suggest, for example, that when individuals assess a statement as true, a single one-step cognitive process or onedimensional analysis is used in which there are sufficient signs, indicators, or attributes of truthfulness to warrant the conclusion that the statement is true. Concluding that a statement is deceptive, however, appears to require a two-step process or multidimensional analysis whereby attributes of deception are present while attributes of truthfulness are overtly or explicitly absent. For example, in a mental status evaluation of a criminal defendant who is malingering, signs of deception may be indicated by the presence of totally unbelievable and/or contradictory statements. At the same time, a deceptive statement is likely to be indicated by the absence of attributes of truthfulness such as specific spatial, temporal or contextual details.

In all, our comparative difficulty in discerning deceptive rather than true statements could result from the truth bias, a reluctance to label another as a liar and/or the greater cognitive work involved in detecting deception. Why, however, would indirect assessment of deception be more accurate than direct assessment? Research by Ten Brinke, Stimson, and Carney [36] specifically suggests the presence of an unconscious mental architecture deriving from our evolutionary history that is activated in the face of deception. It has been suggested that conscious mental processes can actually get in the way of the greater accuracy and objectivity of semiconscious or unconscious observation [10, 36, 37]. Consistent with the concept of cognitive load, for example, Trivers [13] argues that when the conscious mind is preoccupied with some task, unconscious processes are likely to play an enhanced role in our decision-making or behavior. As counter-intuitive as it may seem, such reasoning and its related research implies that people may be better at detecting deception when the task is indirect rather than direct and/or the conscious mind is not specifically focused on the task.

A possible explanation for this phenomenon is based on the idea that there are traits or characteristics about the would-be deceiver that activate deception related concepts relative to the proposed unconscious mental architecture evolution has provided. In support of this hypothesis, Ten Brinke et al. [36], using the Implicit Association Test (IAT) and subliminal cues, provided data indicating that the indirect assessment of deception (e.g. ratings of deception, dishonesty, invalidity, and deceitfulness), was more accurate in identifying actual deceivers in comparison with the straightforward rating of lying. A problem with this operationalization was an almost total overlap between the direct and indirect assessment of truthfulness. To indicate that a person is lying seems more or less the same as saying the person is untruthful, dishonest or deceitful. A stronger and fairer test of the indirect versus direct assessment hypothesis should involve indirect variables that are more clearly independent of the concept of truthfulness or deception.

Several variables are indirectly related to deception. First, one of the most important findings from Bond and Depaulo's [2] meta-analysis is that deceptive statements contain fewer words than true statements. There is no intuitively obvious or a priori reason why the length of a statement would be a reliable predictor of its veracity. Second, the research on CBCA and RM has identified two general categories of variables, one dealing with the clarity and variety of details contained in a statement and the other the realism, relevance and reconstructability of the statement, which have been found to correlate with statement truthfulness though they are obviously independent of it [35]. While the idea of realism may appear to be more closely connected with the perceived truthfulness of a statement than the

quantity or quality of details found in the statement, none of these variables could be considered synonymous with the truth let alone directly indicative of it.

The reliability of statement details and statement quality in verbal content analysis has been found for child victims of sexual offenses, witnesses, and most recently criminal defendants, the population of primary concern in the present research [38]. The evidence from verbal content analysis techniques demonstrating the differing characteristics of true versus deceptive statements suggests that the indirect assessment of truthfulness is more accurate because it simultaneously uses multiple forms of information, as opposed to simply activating unconscious processes [14,36,39]. In other words, instead of the conscious mind interfering with our unconscious processes, it seems more likely that conscious working memory is stretched beyond its capacity. Another problem with the idea of unconsciously-identified deception relates to which attributes of a deceiver or the deceptive message activate the unconscious deception detection machinery. Indirect assessment of truthfulness may be more reliable because it can involve simultaneous assessment of the numerous overt and covert indicators of veracity (such as realism and clarity of details).

The primary goal of this research is to determine whether indirect assessments of truthfulness are more accurate than direct assessments. Statements made by criminal defendants during forensic psychological evaluations will be evaluated using ratings from a measure of client truthfulness (the Forensic Assessment of Client Truthfulness) composed of eight items. These items were originally derived from CBCA and RM, two scales which over the past 20 years have exhibited the best accuracy in distinguishing between true and deceptive statements. This eight-item measure assesses clarity of details, spatial details, temporal details, perceptual details, contextual details, realism, relevance and reconstructability. None of these variables, with the possible exception of realism, is conceptually, directly or intuitively connected with truthfulness.

The pattern of interrelationships between the eight items of the FACT along with the indirect and direct assessment of truthfulness will be examined. For example, while Johnston's research [40] suggests that clarity of detail and statement realism are roughly comparable in their ability to detect deceptive statements, it is also hypothesized that clarity of detail will be more closely associated with the indirect assessment of truthfulness while the realism variable will be more closely associated with the direct assessment of truthfulness. It is also expected that truthful statements will be characterized by the presence of truthful attributes, while deceptive statements will be characterized by the presence of attributes of deceptiveness in combination or juxtaposition with the absence of truthfulness attributes. This difference in assessment is believed to indicate the greater cognitive complexity and work associated with identifying deceptive versus true statements. It is also predicted that the indirect assessment of truthfulness will be based on multiple dimensions or variables while the direct assessment will utilize less information focusing on the evaluation of statements' realism as suggested in previous work. Such data would suggest that indirect assessment of truthfulness may be more accurate, not so much as a result of semi- or unconscious mental processes but rather because direct assessment typically uses less information or fewer dimensions in the attempt to specifically answer the question of veracity.

Before describing the methods and results reported herein, it should be noted that the data used in this write up was originally obtained in the research study described in the above referenced Johnston et al. article [35]. In that paper, Johnston and colleagues focused on demonstrating the ability of the items they extracted from the research literature to reliably differentiate between true and deceptive statements of criminal defendants. The present paper briefly summarizes those findings while focusing on the enhanced reliability of assessing true versus deceptive statements by using an indirect rather than direct approach.

Materials and Methods

Independent variables

Two independent variables were manipulated: the truthfulness of a statement provided by a criminal defendant regarding the allegations against him (either true or deceptive) and the type of forensic psychological evaluation in which the defendant was participating (a probation suitability/ dangerousness or an insanity evaluation). Results from Johnston et al. [35] indicate that when defendants provide deceptive statements in an evaluation of their possible dangerousness, lies of omission are most likely, whereas when defendants provide deceptive statements in an insanity evaluation, lies of commission are most likely. Thus, four statements were taken from the files of the senior author and were selected on the basis of the judicial outcomes in their respective criminal cases. The four research conditions included (1) the truthful statement of a man accused of a sexual offense who provided an exculpatory explanation, (2) the deceptive statement of a man accused of a sexual offense who provided a lie of omission, (3) the truthful statement of a defendant claiming legal insanity who provided a confession, and (4) the deceptive statement of a defendant claiming insanity who provided a lie of commission. The statements made by these four defendants were taken from the files of the notes of the senior author, made at the time of their respective psychological evaluations, who has evaluated mentally ill defendants and accused sex offenders since 1980. It is felt that forensic or clinical psychologists familiar with the evaluation of judicially-referred clients will readily recognize the quintessential or classic nature of these statements. The statements were selected because of their comparative clarity, coherence, and unambiguous content, and were transcribed as close to verbatim as possible from notes taken during the evaluation. The two defendants claiming legal insanity were referred by the court to assess their respective mental status at the time of the alleged commission of the offense. The two accused sex offenders were referred by their attorneys for confidential assessment of their possible sexual dangerousness and their potential suitability for probation. The four statements of the defendants used in this research.

Regarding the deceptive statements, both deceptive defendants were quickly convicted on all criminal charges against them. On the other hand, of the truthful defendants, one of the truthful statements was made by a defendant who was acquitted by his jury on all counts and the second truthful statement was made by a defendant, whose account of his misconduct and plea was accepted by the prosecutor as true, resulting in a successful notguilty-by-reason-of-insanity plea.

Dependent variables

The primary dependent variable is the research participant's overall score on the eight-item Forensic Assessment of Client Truthfulness (FACT) test. The ratings of the items composing the test will also serve as dependent variables: clarity of detail, spatial details, temporal details, reconstructability, realism, contextual details, perceptual details, and relevance. Two subscales alluded to above and derived from a factor analysis of the eight items reported in Johnston [35] will also serve as dependent variables. The five-item details subscale contains clarity of details, spatial details, temporal details, contextual details, perceptual details, while the three-item statement quality subscale contains realism, relevance and reconstructability. In addition to the eight item FACT test, the original research included an item asking the participants to rate the overall perceived truthfulness of each of the four different statements. Scores on the perceived truthfulness item as well as the eight items composing the FACT were rated on five point Likert-type scales, with a score of one indicating either the opposite or absence of the attribute being rated and a score of five indicating maximum presence of the attribute. The midpoint of the scale indicates uncertainty regarding the presence of the attribute or neutrality regarding its presence. The questionnaire is presented in the Appendix A. All items, as well as the overall FACT score, are positively

related to truthfulness. For the sake of simplicity and because this measure is intended for the use of psychologists in assessing client veracity, no counterbalancing of items was felt necessary. The overall score on the FACT can vary from a low of eight, (maximum deception) to a high of forty (maximum truthfulness) with a midpoint of 24. Scores below this midpoint indicate deception while scores above indicate truthfulness. Finally, the item asking participants to rate the overall truthfulness of a statement represents the direct measure of truthfulness while the overall FACT score represents the indirect measure.

Procedures and participants

The participants were 127 university students recruited from an undergraduate forensic psychology class at a large urban university in the northwestern United States of America.

Before rating each statement, participants were given an explanation for each FACT item and explicitly told that this scale was developed to detect deceit. Approximately ten minutes were used to explain the eight items and the rating task. The participants were not provided with any information about the truthfulness/deceptiveness of any of the statements (including the number of true or deceptive statements), nor were they given any form of preparation beyond the FACT item definitions. The ordering of the statements was randomized to minimize carry-over effect. Further, it was explained that participation was voluntary, would have no effect on the students' class grade for classroom participation or otherwise, and was confidential and anonymous. Students who did not wish to participate in the study were excused for the remainder of class without consequence. No personal identifying information was requested or collected as part of the questionnaire.

The research materials were administered to participants who were instructed to read the four statements and consequently rate each one of them on the accompanying nine-item questionnaire. It took the participants approximately 30 minutes to read and rate all four statements. Once all of the questionnaire packets were collected by the researchers, approximately another half-hour was taken to debrief the class and elicit feedback regarding their experience while participating in the study.

Results

Direct versus indirect assessment of truthfulness

Table 1 presents the means and standard deviations for the true and deceptive statements for the direct assessment item, the FACT and its eight items, and the two factor-derived subscales, Statement Details and Statement Quality. Parenthetically, every comparison between the true and deceptive statements was statistically significant beyond the 0.05 level in the predicted direction though these statistical test scores are not reported here as the concern is with comparing the accuracy of the direct versus indirect measures of truthfulness (for readers interested in the results concerning the ability of the individual test items to differentiate between true and deceptive statements, they are referred to the Johnston study [35] . Table 1 displays the percentages of accurate classification of the true statements, the percentages of accurate classification of the deceptive statements, and the average accuracy rates for both true and deceptive statements (Figure 1). Using the direct assessment, 67% of participants correctly identified truthful statements and 83% correctly identified deceptive statements. Overall, the direct assessment averaged 75% accuracy. Using dichotomized FACT scores, which is the primary indirect measure, 86% of participants accurately identified true statements and 81% accurately identified deceptive statements. Overall, the indirect assessment averaged 83% accuracy. While these data indicate that our research participants, upper-division students enrolled in a forensic psychology class, were more likely to exhibit the kind of deception bias indicative of police officers conducting an investigation than the truth bias exhibited by the general population, the overall accuracy of the indirect assessment was about 10% higher than its direct assessment. As can also be seen from the results reported in Table 1, indirect assessment of truthful statements was dramatically more accurate than direct assessment while the indirect and direct assessment approaches were generally equally accurate with regard to identifying deceptive statements. In other words, the greater accuracy of identifying the veracity of statements is entirely a function of the increase in accuracy in identifying true not deceptive statements.

	Truthful conditions		Deceptive conditions		Accuracy of	Accuracy of	Overall average
	Variance	SD	Variance	SD	(%)	deceptive ratings (%)	accuracy (%)
Direct assessment	3.66	1.05	1.81	0.86	66.5	82.7	74.6
Indirect assessment	29.088	5.26	18.359	5.532	86	81	83.5
Clarity of detail	3.99	0.79	2.54	1	72.4	55.5	64
Spatial details	3.77	0.88	2.26	0.98	66.1	65.7	65.9
Temporal details	3.84	0.95	2.21	1.05	70.5	67.3	68.9
Reconstructability	3.79	0.9	2.14	0.86	69.3	70.9	70.1
Realism	3.66	1.04	2.13	0.78	60.2	66.5	63.4
Contextual detail	3.49	1	2.54	0.9	52.8	52	52.4
Relevance of detail	3.97	0.88	2.61	0.93	74.4	47.6	61
Perceptual information	2.75	1.05	2.04	1.01	30.7	71.3	51
Details subscale	15.83	3.32	11.62	3.87	73.2	73.6	73.4
Quality subscale	11.42	2.37	6.89	2.04	76.4	76.8	76.6
Note: Indirect Asse	ssment is the tota	FACT score					

Table 1. Percentages of accurately identiied true and deceptive statements using direct versus indirect measures of truthfulness.



Figure 1. Accuracy percentages using direct and indirect assessment with 95% confidence interval bars.

Of particular interest is the accuracy of the individual items from the FACT in identifying true versus deceptive statements. To begin with, the three variables which have the greatest support in the research literature regarding their ability to differentiate between true and deceptive statements, clarity of detail, spatial detail, and temporal detail, had overall accuracy rates in the mid 60% or above. On the other hand, contextual and perceptual details generated substantially lower overall accuracy rates. For example, the contextual details item generated accurate classification of both true and deceptive statements only slightly above chance. While the overall accuracy rating of the perceptual details item was approximately that of the contextual details item, it generated very high accuracy for deceptive statements but conspicuously low accuracy rates for true statements. This pattern of differential accuracy was also observed for the relevance item which accurately classified true statements at a high level but not deceptive statements. Both reconstructability and realism successfully classified true versus deceptive statements above 60%, also consistent with past research suggesting the comparative accuracy of these items. In all, five of the eight items, clarity of detail, spatial detail, temporal detail, realism, and reconstructability performed extremely well in accurately identifying both true and deceptive statements and of 16 percentages computed, only two to accurately identify true or deceptive statements above the 50% level. Specifically, perceptual details had 31% accuracy for truthful statements while relevance of detail had 47% accuracy for deceptive statements.

Finally, the accuracy rate for the five items combined into the Details

subscale was approximately 73% while the combined accuracy rate for the items composing the Statement Quality subscale was approximately 76%. Even though the Statement Quality subscale has three items relative to the five items of the Details subscale, it is not surprising it would accurately classify more true and deceptive statements, considering how much closer to the concept of truthfulness variables such as realism and relevance are, in comparison with items such as spatial or temporal details. The most surprising thing is that the items defining the Details subscale would generate such high accuracy rates considering how independent of the concept of truthfulness these items appear to be.

Regression analyses

In order to determine how much variability was accounted for by the eight items using either the indirect or direct measure of truthfulness, a series of regression models were computed where the predictor variables included the eight FACT items and the target variable was either overall ratings of truthfulness or the overall FACT score (Tables 2 and 3). It should also be noted that the degree of association between the eight items and the overall FACT score sould be somewhat inflated in that the FACT score by the sum of the eight item scores, since the score of the item being regressed onto it represents one-eighth of the overall FACT score. Nevertheless, even with this minor confound, the respective regressions still permit a head-on comparison of the direct versus indirect assessment of truthfulness regarding the relative importance of the eight items.

Predictor	Overall FACT Score					
	В	SE(B)	t	р		
Intercept	0.214**	0.038	5.662	<0.0001		
Clarity of Detail	0.091**	0.016	5.79	<.0001		
Spatial Detail	0.082**	0.017	4.933	<0.0001		
Temporal Detail	0.044**	0.015	3.028	<0.001		
Reconstructability	0.065**	0.016	4.022	<0.0001		
Realism	0.049**	0.014	3.413	<0.0001		
Contextual Detail	0.032*	0.013	2.481	0.02		
Relevance of Detail	0.067**	0.016	4.303	<0.0001		
Perceptual Detail	-0.006	0.011	-0.601	0.55		

Table 2. Results of a multiple regression of overall FACT score from FACT items.

	Direct Assessment of Truthfulness						
Predictor	В	SE(B)	t	р			
Intercept	-0.0418**	0.122	-3.417	<0.001			
Clarity of Detail	0.153*	0.051	3.03	<0.003			
Spatial Detail	0.113	0.054	2.082	0.38			
Temporal Detail	-0.069	0.047	-1.442	0.15			
Reconstructability	0.25**	0.052	4.843	<0.001			
Realism	0.447**	0.047	9.603	<0.001			
Contextual Detail	-0.064	0.042	-1.51	0.13			
Relevance of Detail	0.144*	0.051	2.855	0.004			
Perceptual Detail	0.082*	0.035	2.369	0.018			
Note: Direct Assessment	of Truthfulness is the perce	ived truthfulness rating. * p<.05.	** = p<.001. Model R2 = 0.66. F(3	3. 118)= 120.3. p<0.0001.			

Table 3. Results of a multiple regression of a direct assessment of truthfulness rating from FACT Items.

The regression model using the FACT score as the target variable accounted for 76% of the variance in these scores and was highly statistically significant (R²=0.76, F (3, 118)=198.4, p<0.0001) (Table 2). With exception of the perceptual details item for which the regression coefficient was zero, all other items exhibited regression coefficients varying between 0.03 and 0.09 with all being statistically significant. The two items most closely associated with changes in overall FACT scores were the clarity of details and spatial details items. On the other hand, all three of the statement quality items (i.e. realism, reconstructability and relevance) exhibited regression coefficients between 0.005 and 0.067 while the contextual details item had a coefficient of 0.03 and the temporal details item a coefficient of 0.04. While there is variation in the size of the eight coefficients with all but perceptual details being statistically significant, no single item or combination of items is particularly large. Even including the perceptual details variables, the range of regression coefficients goes from 0 to less than 0.1, a rather modest range.

The best-fit regression model using the direct assessment of truthfulness as the target variable accounted for 66% of the variance and was highly statistically significant (R2=0.66, F (3, 118) =120.3, p<0.0001). The data presented in Table 3 provide an extremely different picture between the eight items and the direct measure in comparison with the first regression model. While the regression coefficients range from zero to less than 0.1 in the first model, the range in the second model is between -0.06 and 0.44. Consistent with previous research, the item exhibiting by far the strongest relationship with the direct assessment of truthfulness was realism. Reconstructability exhibits the second strongest relationship with the target variable though all other items exhibit regression coefficients between -0.06 and 0.15. Particularly surprising are the negative regression coefficients for the temporal and contextual details items. While the perceptual and contextual details variables have tended to be the psychometrically weakest of the eight items in this research, temporal details has consistently over many studies demonstrated the ability to differentiate between true and deceptive statements. That higher scores on this item would indicate lower direct ratings of truthfulness is surprising though it is very clear from these data that the direct assessment of truthfulness rather than its indirect assessment involves a very different pattern of relationships with the eight predictor items. Indeed, for the indirect assessment the details items are clearly the most important while for the direct assessment the statement quality items are the most important. It is especially surprising to note that the range of regression coefficients for the predictor variables in the indirect assessment is less than 0.1, while the range of regression coefficients for the predictor variables in the direct assessment is 0.5. These data clearly imply that the direct assessment utilized far less information than does the indirect assessment in which 7 of the 8 items play a significant and roughly comparable role.

Factor analyses

In order to better understand the relationships between the eight items from the FACT and the variable of truthfulness, a factor analysis was

performed on the scores from the eight items used to assess the truthful and deceptive statement. Thirty-two variables were entered into the factor analysis: the eight FACT items used to rate the four statements; the true statement of a defendant accused of a sexual offense, the true statement of a criminal defendant claiming legal insanity (a confession), the deceptive statement of a defendant accused of a sexual offense (a lie of omission) and the deceptive statement of a defendant claiming legal insanity (a lie of commission). While all of the eight items are expected to be significantly associated with ratings of both true and deceptive statements, consistent with earlier research, it is expected that the assessment of deceptive statements will be characterized by positive associations with ratings of deceptive statements and negative associations with true statements while true statements will be characterized primarily if not exclusively by positive associations with ratings of true statements. This pattern of relationships between the ratings of true and deceptive statements on the eight items would be consistent with the above described one-step cognitive process in the assessment of truthful statements and the two-step cognitive process in the assessment of deceptive statements.

Finally, a four-factor solution was imposed on this varimax-rotated factor analysis. The 32 items entered into the factor analysis were expected to yield components derived from the four attributes of these items; namely, the true statement including only exculpatory information, the truthful statement involving a confession, the deceptive statement using a lie of omission and the deceptive statement involving a lie of commission. The results of this factor analysis are partly consistent with expectation. Rather than generating four factors associated with the four research conditions (two different true statements and two different deceptive statements), the extracted factors appear to be underlain by themes defined by characteristics of generally deceptive statements, characteristics of generally true statements, characteristics of different types of true statements, and characteristics of different types of deceptive statements (Table 4). Factor 1 is clearly indicative of deception in that every item used to rate both deceptive statements loaded positively on this factor while the only items to load negatively on this factor included ratings of true statements. While Factor 1 is clearly underlain by the concept of deception, Factor 2 is just as clearly characterized by the theme of truthfulness. With two exceptions, all of the items loading on Factor 2 are ratings of the two true statements which are positively correlated with the factor. Of the two deceptive items loading positively on Factor 2 they include ratings of a lie of commission. No items regarding the ratings of the lie of omission were loaded on this factor. With regard to the two deceptive items loading on this factor, of the entire factor loadings, these two coefficients were the two lowest. Given that this statement, the lie of commission included acknowledgement of committing the alleged crime while otherwise lying about the presence of psychotic symptoms, it is not surprising that items rating the lie of commission would exhibit a limited relationship with truthfulness.

Table 4. Factor loadings for ratings of true and deceptive statements using the items from the FACT.

	Component				
	1	2	3	4	
UASO-Item 2-Spatial Details	0.708				
UASO-Item 3-Temporal Details	0.705			0.352	
UASO-Item 1-Clarity of Detail	0.67			0.347	
UIC-Item 2-Spatial Details	0.659			-0.498	
UASO-Item 7-Relevance of Detail	0.614			0.326	
UASO-Item 8-Perceptual Information	0.611				
UASO-Item 4-Reconstructability	0.603			0.491	
UIC-Item 3-Temporal Details	0.601	0.303		-0.463	
UIC-Item 4-Reconstructability	0.597				
UASO-Item 6-Contextual Detail	0.585				
UIC-Item 6-Contextual Detail	0.548	0.31		-0.454	
UIC-Item 1-Clarity of Detail	0.526			-0.471	
UASO-Item 5-Realism	0.51			0.49	
UIC-Item 5-Realism	0.501				
TASO-Item 4-Reconstructability	-0.467	0.39	0.424		
TASO-Item 5-Realism	-0.446	0.343	0.33		
UIC-Item 8-Perceptual Information	0.446				
TIC-Item 7-Relevance of Detail	-0.375	0.613	-0.374		
TIC-Item 6-Contextual Detail		0.584	-0.319		
UIC-Item 7-Relevance of Detail	0.335	0.582			
TIC-Item 4-Reconstructability		0.574	-0.479		
TIC-Item 5-Realism		0.537	-0.324		
TASO-Item 7-Relevance of Detail	-0.444	0.492	0.385		
TIC-Item 3-Temporal Details	-0.327	0.483	-0.312		
TASO-Item 6-Contextual Detail		0.455	0.404		
TIC-Item 2-Spatial Details		0.44	-0.42		
TIC-Item 8-Perceptual Information		0.418	-0.319		
TASO-Item 2-Spatial Details		0.351	0.625		
TASO-Item 1-Clarity of Detail	-0.318	0.347	0.597		
TIC-Item 1-Clarity of Detail		0.501	-0.526		
TASO-Item 3-Temporal Details		0.425	0.47		
TASO-Item 8-Perceptual Information			0.351		

Note: FACT = Forensic Assessment of Client Truthfulness. TASO = Truthful Accused Sex Offender, UASO = Untruthful Accused Sex Offender, TIC = Truthful Insanity Claimant, UIC = Untruthful Insanity Claimant.

Factor 3, on the other hand, only contains loadings from the ratings of the true statements with the true statement containing only exculpatory information loading positively on the factor and the loadings from the true statement containing a confession loading only negatively on this factor. This factor is most closely associated with the concept of exculpation or exoneration given that all of the items used to rate a true statement including only exculpatory information are positively correlated with the factor while all the item rating for the true statement involving a confession negatively correlated with the factor. It is also interesting to note that every one of the statement quality items used in the ratings of both true statements load significantly on this factor suggesting the importance of variables such as statement realism and relevance in the assessment of a statement's veracity claiming exculpation or innocence.

Factor 4, potentially the most interesting, includes loadings from only the two deceptive statements. This factor appears to suggest what

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underlying quality is most indicative of a persuasive or credible lie in that all the ratings of the lie of omission contained in the factor are positive while all the ratings of the lie of commission on the factor are negative. It is also noteworthy that the lie of omission (the more persuasive form of deception) is characterized primarily by factor loadings involving ratings on the statement quality items suggesting that a lie is rated as more persuasive when it seems more realistic and relevant. On the other hand, ratings for the lie of commission in addition to being negative include primarily items assessing the degree of details included in the statement suggesting that a lie of commission may be especially characterized by the absence of the kind of mundane details previous research indicates is capable of differentiating between true and deceptive statements. The data suggest that not only is the clarity and amount of detail important in distinguishing between true and deceptive statements may be just as important in differentiating between different types of deception.

Discussion

The present research extends the findings of recent work [34,36] by demonstrating that the indirect assessment of truthfulness can be more accurate and can account for greater variability in the assessment process by using variables which have no obvious or intuitive relationship with truthfulness. It is not surprising that statement quality variables, such as realism, are very closely associated with the perception of truthfulness. The importance of detail subscale (e.g., spatial and temporal information) may not have an intuitive connection with truthfulness, but it has still clearly demonstrated its ability to accurately classify truthful statements. Each subscale seems to play unique roles. Overall, the detail subscale appears to be the most important in the assessment of deception, while the statement quality subscale appears to be the most important in the assessment of truthfulness. The statement quality subscale better predicts direct assessments of truthfulness, while the statement details subscale better predicts indirect assessments. These subscales also appear capable of differentiating between different types of lies. Specifically, the greater persuasiveness of a lie of omission appears to be more closely associated with the presence of statement quality, while the less persuasive nature of a lie of commission appears to be more closely associated with the absence of details (i.e., the details subscale). These findings indicate that truth is a multidimensional construct.

As expected, the two factor-derived scales composed of the five Details items and the three Statement Quality items exceeded the ability of their respective individual items in accurately identifying true versus deceptive statements. Six of the items (clarity of detail, spatial details, temporal details, realism, relevance and reconstruct ability) proved particularly effective in accurately distinguishing between true and deceptive statements as well as accurately identifying truthful and deceptive statements per se. Perceptual and contextual details items were less reliable than the other six items, but still contributed to the predictive power of the FACT significantly enough to warrant their continued use.

With regard to the poor accuracy of detecting deception, the present data offers support for the idea that, depending on the situation and the evaluator, both truthful and deceptive statements can be difficult to accurately identify . Consistent with the idea of a truth bias, it is simply easier to conclude a statement is true rather than deceptive. The factor analytic results indicate that the assessment of truthfulness involves a single or unitary dimension whereby when sufficient indicators of truthfulness are present, the statement is judged as true. This is consistent with the single or one-step cognitive process described earlier. Further, in the identification of deception two dimensions are utilized requiring the hypothesized two-step cognitive process. As the results indicate, the assessment of deceptive statements includes the presence of attributes of deception as well as the absence of attributes of truthfulness. Deceptive statements are characterized by a particular pattern of low details and low statement quality, as well as the overt absence of attributes of truthfulness, especially realism. Indeed, it appears to be that the absence of realism, (i.e. an overtly unrealistic or incredible claim), nails down the conclusion that a statement is deceptive, that it is a lie. Forensic psychologists evaluating criminal defendants would be especially aware of the phenomenon whereby a deceptive defendant engaging in either lies of commission or omission, describes their alleged offense in language low in relevant details and high in unrealistic or incredible claims, quintessential characteristics of deception. For example, an accused sex offender may claim that he was falsely accused of child molestation because he was too generous with the victim and her family or that the child victim made him do it. It is not simply that the deceptive statement of many criminal defendants lacks persuasive details but rather that their statements are often patently absurd, claiming things that simply do not exist in the real world.

One of the most interesting implications of the present results is that there are situations in which it may be even more difficult to accurately identify truthful rather than deceptive statements. The participants in the present study, primarily a mix of undergraduate psychology and criminal justice majors, were more accurate in identifying deceptive than truthful statements using the direct approach. One would expect that such students would exhibit something of the deception or "lie" rather than truth bias indicative of police and criminal investigators especially considering that the research participants were specifically informed that the study in which they were participating dealt with deception detection among criminal defendants. Given that one of the most important topics discussed in these classes, prior to administering the research questionnaire, focused on deception detection, it is unsurprising that research participants would have been so sensitized to the possibility of deceptive statements. That these participants enjoyed such a substantial increase in the accurate identification of truthful statements, indeed raising their accuracy level to approximately that of their ability to identify deceptive statements, may suggest that indirect approach as operationalized in the FACT test could be of special utility to forensic psychologists. It would not be unreasonable to imagine that a occupational hazard for forensic psychologists, just as for police officers and prosecutors, could be a tendency to become jaded, expecting client deception as a matter of course. The greatest practical utility of the FACT test could lie in its ability to quickly and easily provide the forensic psychologist with empirically based information indicative of truthful rather than deceptive statements. It is, nevertheless, rather interesting to contemplate the major implication of these data that people generally are so poor at detecting deception because of a truth bias while police officers appear more or less comparably poor at detecting deception because of a lie bias. Perhaps the ultimate utility of an instrument like the FACT test is that it permits independent assessment of both true and false statements in the light of what empirical research indicates respectively characterizes them.

With regard to the question of why the indirect assessment of truthfulness may be more accurate than the direct assessment, the results of the regression analyses indicate that the direct assessment of truthfulness is overwhelmingly dominated by the judgment of realism. Indeed, the realism of a statement appears to represent the primary decision-making heuristic in the direct assessment. Interestingly, the reconstructability of a statement appears to be the second most important variable in the direct assessment and, like realism, is significantly more important in directly assessing veracity than any of the other six items. The details items, which considerable research over many years has shown to be highly reliable in distinguishing between true and deceptive statements, plays a surprisingly small role relative to realism and reconstructability in the direct assessment of truthfulness. In the indirect assessment the eight items including both the Details and Statement Quality items are all relatively close to each other in importance. While it is obvious from Johnson and Raye's [40] theory of internally-originating versus externally-originating memory why variables like clarity of detail would be relevant to the assessment of truthfulness, these details variables are not as clearly or intuitively connected with veracity in comparison with variables such as realism and reconstructability.

The superiority of the indirect assessment of truthfulness appears to be connected with the greater or enhanced use of relevant information in determining veracity. While the attribute of realism is definitely related to veracity, representing the central heuristic that people use in determining veracity, other relevant sources of information are likely to be overlooked or ignored. While it may be clear in light of the theory of memory or of empirical research that statement details items are as indicative of truthfulness as realism or reconstructability, the tendency to focus on the one big variable of realism is hardly surprising given the nature of decision-making heuristics and the increased cognitive work in detecting deception. Thus, while Trivers and ten Brinke et al. [14,36] may be correct in hypothesizing the existence of an unconscious mental architecture involved in the detection of deception, the greater accuracy of indirect assessment may simply be a function of the greater amount of information available in identifying deception when the assessment of truthfulness is based on multiple factors rather than the simple, direct question of veracity. In this study, eight variables, all empirically connected with truthfulness, were assessed by research participants. While using one critically important variable in assessment is the essential feature of a decision-making heuristic, it cannot begin to encompass the amount

and variety of information available to a decision maker who utilizes a list of variables known to be connected with the object of assessment.

It is now necessary to acknowledge the substantial limitations of the study. While the four criminal defendants' statements were selected on the basis of their being as representative of their particular treatment condition as possible, there was only one statement per condition and it is impossible to know how these statements compare with the extent of all true and deceptive statements made by defendants. Further, it is impossible to know the extent to which true and deceptive statements correlate with the kinds of true and deceptive statements made by alleged defendants accused of other crimes and in other phases of the criminal justice process.

The method of selection for the four statements in the research conditions was imperfect, as they were transcribed from clinical notes. In the real world, it is impossible to absolutely know when a statement made by a criminal defendant is true or deceptive, which is why a client's statement of innocence tends to be viewed as true on the basis of an acquittal by the legal system. The judicial outcomes of these four cases were singular and unusual in their suggestion that the two truthful defendants were, in fact, telling the truth while the two deceptive defendants were clearly lying . The truthful defendant claiming legal insanity's psychiatric history and description of his psychotic symptoms at the time of the commission of the alleged crime were so persuasive that the District Attorney's (DA) Office prosecuting the case stipulated to the court-ordered psychological evaluations that all opined the defendant was legally insane. The deceptive defendant claiming insanity had his insanity plea rejected by a jury and was ultimately found guilty on all criminal charges. His extensive criminal history and nonexistent psychiatric history were clearly relevant to the judicial outcome. The truthful accused sex offender was acquitted by a jury on all counts in less than two hours and, following the trial, a number of jurors stated their belief that the DA's office seriously erred in bringing these charges and that the defendant was "factually innocent" rather than simply "not guilty". The deceptive sex offender was convicted by a jury on all counts in a comparable amount of time.

The participants in this study were upper-division college students with a specific interest in forensic psychology who clearly lacked the truth bias exhibited by most people. However, similar results are expected if the measure were to be utilized by psychologists that have received training in the administration of the FACT. The use of students as participants is supported by the findings of Aamondt and Custer (2006), which indicated that individual differences, including age, gender, education, law enforcement experience, and confidence are all unrelated to the ability to detect deception.

Conclusion

In light of the research literature regarding deception detection, it is reasonable to conclude that the eight-item FACT test possesses a sufficiently high level of reliability and construct validity to make it useful to psychologists who have concerns regarding client veracity in cases involving criminal defendants, crime victims and potential witnesses of criminal acts. It is also believed that the FACT test is relevant to cases concerning clients involved in the spectrum of legal matters such as child custody, personal injury or disability claims. The increased accuracy of the indirect measure over direct or subjective assessment is due to the multiple sources of truthfulness-related criteria encompassed in the indirect approach, which allows the psychologist to make a more accurate structured judgment. While psychologists might assess client veracity with regard to their clinical experience, such as the consistency of a client's statement over time, the FACT test can serve as an adjunct to the psychologist's evaluation involving the use of empirically-tested items whose efficacy in distinguishing between true and deceptive statements has been established over many years and many studies. Though more research is necessary with regard to the generalizability or external validity of the FACT, this study offers one additional tool for the psychologist. It is hoped that the theoretical framework underlying the FACT, focusing on memory, cognition, and the role of information processing in detecting deception will enhance the ability of the forensic psychologist to explain the use of this measure to a judge or jury.

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Post script: As the result of a clerical error, the most important published article underlying the present research was omitted. This article ('Attributes of True and Deceptive Statements Made in Evaluations of Criminal Defendants' by Shawn Johnston PhD, Alexis Candelier BA, Dana Powers-Green MA and Gabriel Johnston MA (2016), Journal of Forensic Psychology Practice, 16:5, 347-373, (DOI: 10.1080/15228932.2016.1219218). This article includes three appendices which contain a copy of the Forensic Assessment of Claint Truth fulness Test (F.A.C.T test), the stimulus materials which were provided to the research subjects, and more extensive definitions of the items composing the F.A.C.T. test. Also, since I am now retired and no longer teaching, please address inquiries to shawnjohnstonphd@comcast.net.

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