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AUGMENTING ACID WITH AFFECTIVE DETAILS TO ASSESS CREDIBILITY

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Abstract

There is a need within the criminal justice systems of many countries to create a valid and applicable system of investigative interviewing and credibility assessment. The present study assesses the general validity of such a system, called Assessment Criteria Indicative of Deception (ACID). ACID comprises interviewing strategies that facilitate the detection of deception and content criteria that highlight differences in verbal behavior. Sixty university undergraduates performed a staged theft under time pressure and with incentives designed to increase external validity. The participants were interviewed and assessed using the ACID procedure. Half of them were instructed to answer honestly and the other half to deny his/her participation in the theft. Results showed that honest statements were longer, more vividly detailed, and more spontaneously structured than deceptive statements. Also, the addition of affective details as a dependent measure significantly improved the ACID system. Overall, 48 of 60 statements were accurately classified (26 of 30 honest statements and 22 of 30 deceptive statements). The ACID procedure was effective and benefited from the addition of affective details. The strengths and weaknesses of this study are discussed in light of basic research into deception and potential forensic application.

Keywords: Investigative Interviewing, Credibility assessment, Detecting deception, Content analysis, Testimony.

Resumen

En muchos países, se demanda en el sistema de Justicia Penal de protocolos válidos de entrevista de investigación y de evaluación de la credibilidad del testimonio. Se diseñó un estudio para poner a prueba de un sistema llamado Assessment Criteria Indicative of Deception (ACID). El ACID engloba estrategias de entrevista que faciliten la detección de engaño y criterios de contenido que lo diferencian en el comportamiento verbal. Sesenta estudiantes universitarios participaron en una tarea de robo simulada con incentivos diseñados para aumentar la validez externa. Posteriormente, los participantes fueron entrevistados y evaluados mediante el ACID, instruyendo a la mitad para que respondieran honestamente y la otra mitad para que negaran haber participado en el robo. Los resultados mostraron que las declaraciones honestas eran más largas, más vívidamente detalladas y estructuradas más espontáneamente que las inventadas. Asimismo, la adición de detalles afectivos como variable dependiente mejoró significativamente el ACID. En general, 48 de las 60 declaraciones fueron clasificadas correctamente (26 de 30 declaraciones honestas y 22 de 30 declaraciones inventadas). El ACID resultó eficaz, mejorando con la inclusión de información afectiva. Los puntos fuertes y debilidades de este estudio se discuten para el establecimiento de implicaciones en la investigación básica y la aplicación forense.

Palabras clave: Entrevista de investigación, Evaluación de la credibilidad, Detección del engaño, Análisis de contenido, Testimonio.

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Introduction

The legal system is often required to make decisions on the basis of statements given by witnesses and suspects. Naturally, there are incentives to distort or omit information during an investigation. To counter this, professionals need strategies that gather the maximum amount of accurate information, and that also provide indication when a person is distorting or withholding. In other words, there is a need for a system of investigative interviewing and statement analysis that can be easily trained and applied.

Assessment Criteria Indicative of Deception (ACID) is an integrative approach to interviewing and statement analysis (Colwell, Hiscock-Anisman, Memon, Taylor, & Prewett, 2008). The ACID process begins with the Reality Interview (Colwell, Colwell, Perry, Wasieleski, & Billings, 2008), which incorporates specific strategies to facilitate the detection of deception. The statements generated by this technique are then assessed using verbal content criteria derived from CBCA (Colwell, Hiscock-Anisman, Memon, Rachel, & Colwell, 2007; Vrij et al., 2009), Reality Monitoring (Johnson, 1988; Sporer, 2004) and impression management research (Colwell et al., 2007; Colwell, Hiscock, & Memon, 2002; Colwell, Hiscock-Anisman, Woods, Memon, & Michlik, 2006). The current purpose is to: 1) continue validation of the overall ACID approach, and 2) study whether adding emotional details as a content criterion improves the ability of ACID to detect deception.

Reality Interview

The RI¹ is a derivative of the original Cognitive Interview that is specifically designed to discriminate honest from deceptive statements (Colwell et al., 2002). The RI attempts to increase the difficulty for deceivers while acting as retrieval cues for honest respondents (Colwell et al., 2002; Colwell, Hiscock-Anisman et al., 2008). Specifically, the technique incorporates multiple recall attempts, reverse-order recall, and unanticipated questions in the form of two-alternative, forced-choice inferences. Multiple recall attempts highlight impression management for deceivers (Colwell et al., 2002; Colwell, Hiscock-Anisman et al., 2008). Reverse-order recall and unanticipated

¹ The RI was first called the Inferential Interview in Colwell, Hiscock-Anisman, & Memon, 2002.

questions increase the amount of cognitive effort required (Colwell et al., 2002; Colwell, Hiscock-Anisman et al., 2008; Vrij et al., 2009). Inferences require relatively deep cognitive processing. This is meant to make deceivers more anxious and work harder as they have to think outside of any planned lie script they have created (Colwell et al., 2002; Colwell, Hiscock-Anisman et al., 2008; Porter & Yuille, 1996). The two-alternative, forced-choice method allows for the insertion of a technique to uncover attempts by deceivers to hide knowledge that they actually possess. In numerous settings, it has been suggested that people attempting to hide knowledge often perform worse than chance on this type of task (Colwell & Sjerwen, 2005; Colwell, Colwell et al., 2008; Hiscock & Hiscock, 1989).

Table 1. Script for Reality Interview.

	Recall Task	Phrase from Recall Task	Interview Portion for Scoring
1.	Baseline and Rapport	a. "Last meal." b. "First day of semester."	Not Scored
2.	Free Recall	"Please describe, in as much detail as possible, everything that happened in Room 22A."	Free Recall
3.	Mental Reinstatement of Context	"Think about and include all sights, sounds, smells, emotions, thoughts, or anything else from time of event."	Mnemonics
4.	Inferential Block 1	a. "If a police officer had been present, would he have noticed something wrong?" b. "Was a crime committed?" c. "Did anyone speak with an accent?"	Not Scored
5.	Recall From Other Perspective	"If someone else had been in the room, what would they have seen?"	Mnemonics
6.	Inferential Block 2	a. "Did anyone intend to harm anyone else?" b. "Was this an act of violence?" c. "Were there any weapons in the event?"	Not Scored
7.	Reverse Order Recall	"Beginning with last, and ending with first, please describe entire event in reverse order."	Mnemonics

Table 1 (continued). Script for Reality Interview.

	Recall Task	Phrase from Recall Task	Interview Portion for Scoring
.	Inferential Block 3	a. "Did you notice anything unusual about the room?" b. "Would anyone think that you did something you weren't supposed to while in the room?" c. "Do you think that you could have been mistaken about anything you have said so far?"	"Any mistakes" scored as Yes or No
9.	Retell Entire Event	"Please describe, in as much detail as possible, everything that happened in Room 22A."	Mnemonics

Content Criteria

Reality Monitoring (RM): honesty is higher in detail categories: external and contextual. A significant amount of research has supported RM in general (Masip, Sporer, Garrido, & Herrero, 2005). Though there have been some disagreements about specific operational definitions, the overall system appears to have validity. For example, the operational definitions used by Vrij and by Colwell led to equal performance in a recent study, despite their apparent differences (Memon, Fraser, Colwell, Odino, & Mastroberardino, 2010). However, there are significant shortcomings with just using memory-based criteria when assessing the credibility of adult statements (Colwell et al., 2002; Colwell et al., 2006; Köhnken, Schimossek, Ascherman, & Hofer, 1995; Memon et al., 2010, Masip et al., 2005).

Impression Management: Interpersonal deception during the investigative interview requires a balance between disclosing sufficient information to satisfy the interviewer and withholding any information that could potentially lead to detection (Colwell et al. 2002; Colwell, Hiscock-Anisman et al., 2008; Hartwig & Doering, 2009). Both honest respondents and deceivers have been found to believe the best way to convince an interviewer is to provide a relatively short, clear, and well-phrased description of the event in question. Deceivers are more likely to track their statements, and are more reluctant than honest respondents to add additional detail after they have provided their initial description. This is contrary to the principles of vividness and

spontaneity, however, which research has shown to be a key element in honest statements (Colwell et al., 2007).

Vividness is a quality that emerges from accounts with a large amount of overall detail, with a large proportion of this detail derived from sensory experience. This proposed increase in vividness for honest recall is due hypothetically to the nature of a memory for a witnessed event—that is, one who is reporting an experienced event should be able to access a rich array of details regarding that event (Colwell et al., 2007). Spontaneity is a quality that emerges when an account does not follow a strict, invariant structure. When minor changes in content occur during the course of an account, it is said to be more spontaneous (Colwell et al., 2007). The RI is able to further distinguish honest from deceptive statements using this principle to highlight the amount of detail. The overall design of the RI enhances the ability of the respondent to have and add vividness and spontaneity to their statement while hindering the deceiver by increasing the cognitive load forcing the individual to stick to the lie script that they have created.

In summary, the current study seeks to replicate the ACID system, as well as assess the potential benefit from adding the criterion of “affective details” as a dependent measure. It is hypothesized that honest statements will be longer and more detailed than deceptive statements. Further, the differences between honest and deceptive statements will be most visible during the mnemonic portion of the RI. The first set of hypotheses revolve around a replication of previous acid findings, that is honest statements should be longer and have more external, contextual, internal details than deceptive statements, and these difference should be more apparent during the mnemonic portion of the RI. The next major hypothesis is that the addition of affective details will significantly improve the performance of the ACID system. For practical significance, the ACID criteria will also be used to classify statements as honest or deceptive. Together, the study aims to provide information regarding the basic nature of verbal behavior during an investigative interview and give indication to practitioners regarding the potential application of interviewing and credibility assessment. The current purpose is to: 1) continue validation of the overall ACID approach, and 2) study whether adding emotional details as a content criterion improves the ability of ACID to detect deception.

Method

Participants

Sixty-seven student participants took part in this study. Four were dropped because they did not complete the experiment, and three were dropped as multivariate outliers based upon Mahalanobis distance (two from the deceptive group and one from the honest group). The sample was 64% female (36% male), with a mean age of 23 (SD = 1.4). Sixty-three percent of the participants identified themselves as Caucasian, 23% as African American, 11% as Asian-American, and 1% as "Other." These participants volunteered for extra credit and up to \$27.00 for successful completion of the study. Participants were recruited from Psychology, Anthropology, and Criminal Justice courses.

Materials

The stimuli for this experiment included a tennis ball and a number of small items hidden in a converted science lab that is used as a classroom. The items were things such as pictures of the experimenter, his wife, and their pets, books, pens, pencils, a bottle of vodka, champagne glasses, and other small objects that could be hidden in drawers, placed upon shelves, or hung on walls. One of the most important materials was a loud, bell-type manual timer and alarm. Additionally, this experiment employed investigative interview scripts derived from the Reality Interview, which is a permutation of the Cognitive Interview designed specifically to detect deception. These interviews were recorded on audio, and transcribed. The resulting transcriptions were rated according to the ACID procedure (Colwell, Hiscock-Anisman et al., 2008).

Design and procedure

Participants met a student Research Assistant (RA1) who explained the study and obtained written informed consent. The participants were instructed to enter a university classroom on the same floor of their current building. They were to search this classroom and find the hidden tennis ball. This classroom was being watched by another Research Assistant (RA2). RA2 was responsible for checking the room every 15 minutes, and to reset the timer and alarm. The participants were told that they were not to be caught in the room by RA2, and that they were to look at the timer to estimate the amount of time they had until her or his return. If they were caught in the room by RA2, they were told that

they would not receive any extra credit points or money for the experiment. By the time the participants entered the room, they typically had approximately 10 minutes to search and exit, and there was a loud timer ticking to remind them of this.

Once participants found the ball, they returned it to RA1. Upon completion of this portion of the experiment, participants were told they would receive 1 point of extra credit and \$2.00. Plus, they were now eligible for the second half of the experiment (4 participants never found the ball or were caught while trying). In reality, all participants received two points of extra credit and \$7.00, and were eligible for the lottery for two \$20.00 prizes.

Upon return with the ball, RA1 instructed the participants to imagine that they were going to be investigated for the theft of the ball. They were to return during the next work week for an investigative interview ($M_{\text{delay}} = 6$ days, $SD = 2.1$). Half of the participants were instructed to report as completely and convincingly as possible, the other half were instructed to distort their testimony so that they were not implicated in the theft. Both groups were told that they had to convince the interviewer in order to receive an additional point of extra credit and \$5.00. Also, they were told that the two “best and most convincing” statements would each win \$20.00.

As a result of the procedure and manipulations described above, all participants entered the converted science lab, looked around, and stole a tennis ball. They were under pressure not to get caught, and reminded of the possibility of being caught by a loud timer. Instructions whether to report honestly or deceptively at the upcoming interview were given after the ball was stolen. These instructions divided the remaining participants into two equal groups of thirty.

Each participant was interviewed in a one-to-one setting by a trained Research Assistant. The interviews were conducted according to a semi-scripted version of the RI (Table 1). There was approximately a one-week delay between the theft and the interview ($M = 7.2$ days, $SD = 1.1$).

Measures

This study examined Colwell, Hiscock-Anisman et al.’s (2008) ACID procedure with the addition of Affective Details. All transcripts were coded for the following criteria: response length (number of words), and the amount of unique external, contextual,

affective, and internal details. Each of these was assessed as total values for the entire interview (see Table 1). Following this, each variable was split on the basis of where in the interview the measure was taken, so that each total score was divided into the unique amount provided during free recall and the unique amount provided during the mnemonics section of the interview. Transcripts were coded for details by four trained raters who were blind to the conditions and the hypotheses of the experiment. Response length was coded by software written for this purpose.

Measures were operationalized as described in Colwell et al. (2002) and Colwell, Hiscock-Anisman et al. (2008, p. 173), with the addition of Affective details. External details were defined as information regarding the event in question that was gained from the senses (e.g., describing who, what, where). For example, the phrase ‘a tall man with red hair’ contains four external details. Contextual details describe relationships amongst objects and/or actors (e.g. temporal, spatial relationships). The sentence ‘The rings were on top of the desk’ contains one contextual detail. Internal details were defined as information regarding the subjective experiences, or cognitive processes of the respondent, as well as any information that referenced the respondent’s history rather than the event in question. Therefore, the sentence ‘I was nervous’ contains one internal detail. Affective details deal with the emotional state of the respondent during the time of the target event, such that, “The timer made me anxious,” would be one Affective detail.

The training of raters followed the same structure as reported in Colwell et al. (2007). This training consisted of three one-hour group meetings, with homework assignments between two of the meetings, and a final meeting to reach consensus. During the first meeting, each of the four classes of detail was defined, and raters were provided with standard scoring sheets to ensure consistent operational definitions of the variables. All of the practice transcripts followed a precise script that was analogous to the interview script used in the present experiment. Raters were trained only to code each detail the first time it appeared within a statement. A detail mentioned in response to two different interview questions was tallied only in response to the first one. The result is that only the amount of novel detail elicited in response to each recall task of the interview was available for assessment. This allows for the tracking of unique details as they are added throughout a statement in order to highlight spontaneous additions.

Training began with a lecture defining each category of detail, and the procedure for tallying the amount and type of details present in a transcript. Raters practiced this detail tally procedure in an example transcript, and then reviewed these codings with Dr. Colwell. A second practice transcript was done as homework and reviewed at the second group meeting. This process was repeated for a third transcript. At the final meeting, all discrepancies were resolved and raters were able to have one final round of discussion. Child witness statements from a previous training package (provided to the second author by John Yuille) were used as practice transcripts so that raters would remain blind to the experimental conditions of the present study.

After training, the raters each scored ten practice transcripts from previous studies. The inter-rater reliabilities, as measured by correlation and average proportion agreement, were: External = .85 (87%), Contextual = .92 (94%), Internal = .64 (72%), and Affective = .80 (83%). The most common difficulty was determining if a piece of information was “irrelevant” to the event in question, and therefore an Internal detail. The test-retest reliability for Response Length was 1.0.

There were four raters, and each transcript was rated twice, in counterbalanced order. The actual scores used for analysis were the average of the two rater’s scores. This was done to reduce rater bias due to individual differences or potential practice effects.

Results

Preliminary reading

All transcripts were read by a Student Research Coordinator to make certain that participants had followed directions, and that honest statements contained a description of the theft and dishonest statements were somehow distorted to direct blame for the theft away from the participant. Dishonest statements often did contain a description of the theft, but it was described as if it was done by another person. Other dishonest statements chose to provide a general description of time in the room, without mentioning the theft. The transcripts were also read to make certain that each interview was properly conducted.

Data screening

The data were initially analyzed by comparing case number to Mahalanobis Distance. Four multivariate outliers were uncovered, two honest and two deceptive. This was dealt with by randomly choosing four of ten “reserve” statements which were derived from additional participants which were set aside to be used only in case of lost or unusable data. This allowed for keeping cell sizes at 30 each.

The data was gathered as frequency scores. These scores were mildly skewed. To address this skew, the dependent measures were converted to a 5-point scale, with a mean of 3. The resulting transformed data were not skewed. Interestingly, there were no differences in predictive accuracy or levels of significance when comparing the frequency data to the transformed data. This lack of difference is also consistent with the fact that Pillai’s Trace, which is designed to be stringent in circumstances where data violate the assumptions of normality, was not different from Wilk’s Lambda, which is not as stringent. This lack of difference occurred because MANOVA is generally robust to violations of normality (Field, 2005; Olson, 1976). The calculations are conducted on the sampling distribution of the mean rather than on the raw data values themselves. The sampling distribution is inherently robust. When cell sizes reach 30, the sampling distribution of means is normal and follows all assumptions of parametric statistics (Central Limit Theorem). Therefore, the frequency data will be described as it is easier to interpret and train to potential investigators.

Interviewer and Rater Bias

Two 4 x 5 Pillai’s Trace MANOVAs were performed to evaluate the potential for Interviewer and Rater biases. The first, $F(4, 56) = .86$, *ns*, found no relationship between Interviewer and the dependent variables (Response length, External, Contextual, Internal or Affective details). The second, $F(4,56) = .47$, *ns*, found no relationship between Rater and the dependent variables.

Mean Comparisons

A 2 x 5 Pillai’s Trace MANOVA performed on the frequency data for each variable indicated significant difference(s) in Response Length, External, Contextual, Internal, and Affective details as a function of honesty versus deception, $F(5, 55) = 2.8$, $p < .05$, with observed power $(1 - \beta) = .82$. An ANOVA was performed for each of the

dependent measures². The means, F ratios, p values, and Eta's for each of the variables are presented in Table 2. Significant relationships between honesty and deception were indicated for External, Contextual and Affective details, as well as Response Length. The values for each of these variables were larger for the honest than for the deceptive statements. No significant difference was observed in Internal details as a result of instructions to distort testimony.

Table 2. Means, standard deviations, and effect sizes for revised ACID Criteria.

Variable	Honest M (SD)	Dishonest M (SD)	F	p(one-tailed)	Eta ²
Total					
Interview					
External	67.5 (39.0)	52.1 (27.7)	2.2	.08	.37
Contextual	34.5 (21.9)	20.8 (13.1)	6.2	<.01	.62
Internal	11.6 (11.4)	8.3 (5.4)	1.5	.12	.30
Affective	2.4 (2.1)	1.6 (1.9)	9.9	<.001	.78
Response length	468.0 (318.0)	319.5 (170.4)	3.6	.03	.47

Note. $df(1, 58)$. The same pattern of significance and effect sizes was found using raw data as well as data transformed to fit a 5-point scale.

Colwell and colleagues (Colwell et al., 2002; Colwell et al., 2007; Colwell, Hiscock-Anisman et al., 2008) stated that the major difference between honest and deceptive statements obtained by the RI are manifested as fewer words and details added by deceivers following their free recall statement. Two hierarchical regressions were used to test this hypothesis. First, the interviews were broken into two phases, Free Recall and Probes (Table 1). The first regression tested whether the information obtained during the Probes stage of the interview significantly added to the information obtained during the Free Recall phase of the interview. In the first regression, the first block of variables entered consisted of the values for each measure taken at Free Recall (Response Length and External, Contextual, Internal, and Affective detail values for Free Recall). The second block of variables to be entered consisted of the same set of measures taken during the Probes section of the interview (Response Length and External, Contextual, Internal, and Affective detail values summed across open-ended

² Frequency scores and standardized quintile transformations were examined for each variable, and there was no difference in levels of significance. Furthermore, the prediction rates obtained through a discriminant function analysis were identical for the two methods of analyzing the data. Therefore, the frequency data, which is the simpler of the two, are reported. Although this data is also representative of the standardized five-point scales, due to the lack of differences.

questions following Free Recall). This regression indicated a significant overall relationship ($R^2 = .67$), and a significant increase in explanatory power as a result of adding the Probe information, $R = .3$; $R^2 = .67$; $F_{\text{change}}(5, 52) = 3.2, p < .05$. The second hierarchical regression used to test the hypothesis entered terms in the opposite direction, to test whether the information obtained in Free Recall added significantly to the information obtained during the Probes. The overall relationship between the observed measures and instructions to distort testimony are the same for regression one and regression two. However, regression two did not indicate a significant improvement in explanatory power resulting from the Free Recall values, after controlling for the explanatory power of the Probes values, $R = .51, R^2 = .67, F_{\text{change}}(5, 52) = 1.8; ns$. Taken together, these two analyses indicate that the major differences between honest and deceptive statements were observed during the Probe portion of the interviews, rather than during Free Recall.

Affect

An additional hierarchical linear regression was employed to assess the impact of adding Affective details to the ACID dependent variables. The first block of the regression controlled for the original ACID dependent measures (Response length, and the total values for External, Contextual, and Internal details). In the second block of the regression, the total amount of Affective details was added. The addition of Affective details led to a significant increase in the overall amount of variance explained, $R = .42, R^2 = .53, F_{\text{change}}(5, 52) = 4.9, p < .05$. This indicates a significant increase in the amount of variance explained between honest and deceptive statements by adding Affective detail totals to the variables listed in the first equation.

Classification Rates

A discriminant function analysis was conducted to classify statements as honest or deceptive on the basis of Response Length and External, Contextual, Internal, and Affective detail values (Table 3). Overall, 48 of 60 statements are correctly classified as honest or deceptive, with 26 of 30 honest and 22 of 30 deceptive statements accurately classified. To protect against potential inflation of accuracy rates which can occur with discriminant analysis, the leave-one-out method of cross-validation was used. Cross-validation indicated an overall accuracy of 65%, with 66.7% of honest and 63.3% of deceptive transcripts accurately classified.

Table 3. Classification Accuracies using ACID totals upon Initial and Cross Validation.

Initial Validation	Predicted Honest	Predicted Deceptive	% Correct
True Honest	26	4	86.7%
True Deceptive	8	22	73.3%
Total	34	26	80.0%
Cross Validation*			
True Honest	20	10	66.7%
True Deceptive	11	19	63.3%
Total	31	29	65.0%

Note. * Cross validation performed using the “leave-one-out” technique.

Discussion

This study represented a successful replication and extension of the ACID procedure. The focus of ACID is to track the amount and distribution of critical variables across the course of an investigative interview designed to facilitate the detection of deception. In addition, this study complemented previous research by creating an experimental situation with some anxiety during the target event, with penalties for detection and incentives for successfully convincing the interviewer of one’s honesty. This study was able to extend previous ACID research by adjusting the operational definition of “affective” details. These points will be discussed in terms of research and practical implications. Finally, limitations and problems that must be addressed prior to practical application will be considered.

This experiment sought to create a forensically-relevant set of stimuli by integrating elements from real life scenarios. Participants were forced to monitor the passage of time to avoid being caught committing the theft. This added a level of anxiety to the task which would occur for an individual while committing an actual crime. Participants were also informed that they would lose the opportunity for money and extra-credit if they were not successful in their theft, or in convincing the interviewer of their honesty. Integrating these two elements into the design attempted to account for the motivation that an individual would feel while being accused of a crime. Although the degree of motivation was not equal to that of being legally prosecuted, it did provide an incentive for the participants to take the investigation seriously or

otherwise risk losing something (i.e. monetary compensation) of personal interest. Similarly, participants had approximately a week to plan prior to the investigative interview. This technique is congruent to a police investigation where information regarding the crime and participants can take time to compile resulting in a delay between the occurrence of the event and the interviewing of a suspect.

It was important for this investigation to incorporate similar circumstances to a real-life scenario in order to appraise the ACID technique for possible use in practical and field application in the future. Even with the addition of affective details to the content analysis, significant results were shown in accordance with previous ACID research. Honest statements were longer and more detailed than deceptive statements and contained greater external, contextual, and affective details. This increase in details is consistent with the predictions of RM research (Colwell, Hiscock-Anisman et al., 2008; Johnson et al., 1988; Masip et al., 2005; Memon et al., 2010; Vrij et al., 2009). These findings support the general validity of RM in credibility assessment, and are also consistent with what Colwell, Hiscock-Anisman et al. (2008) described as vividness. Honest responders provided longer and more detailed statements, and these statements were richer in sensory detail and more embedded in time and place. However, these characteristics alone are not sufficient to fully explain the differences between honesty and deception.

The largest difference between honest and deceptive statements was in the distribution of response lengths and detail amounts throughout the statement. Honest respondents were able to add more detail as the interview progressed resulting in longer response lengths. Conversely, the deceptive respondents had significantly fewer details added to their statement after the initial free recall resulting in shorter response lengths than the honest respondents. This can be attributed to the design of the RI in facilitating the recollection and spreading activation of the memories for the event for honest participants while increasing the cognitive load and anxiety for deceptive participants. This phenomenon is illustrated by impression management where in previous research participants thought that having few contradictions was important in being convincing (Colwell & Sjerven, 2005; Hartwig & Doering, 2009; Granhag et al, 2004; Hines et al., 2009). Therefore the deceptive participants did not add details and stuck closely to their lie script to avoid creating contradictions in their story.

The addition of affective details to the ACID method was also successful. Significance was found at all levels of the original system and was also found in affective details as well. The addition did not impede on any existing findings, but actually attributed to the overall significance levels of the system. In fact, the affective details category had significance at a very low alpha level of .001 and had the largest effect size of any of the significant categories. Therefore the incorporation of affective details mirrored the original ACID findings and strengthened the validity of the system.

Although the addition of affective details heightens the overall ability of the system to accurately detect deception, there are some issues in practical application. It was observed during testing that both honest and deceptive respondents were reluctant to add affective details to their statement even after being prompted to do so which generates the question as to whether it will be consistently reliable in the real world. It is a strong predictor of deception when it is present in a statement, but in the absence of affective detail the original ACID criteria has to be relied on. The other categories appear naturally throughout the statement using the RI. Affective details, however, need to be prompted explicitly in order for most of the participants to include this information.

The current study provides several areas for future research. The incorporation of real-life scenario qualities to the experiment was a necessary step for the use of ACID in practical and field application. Future studies could further investigate this aspect by including scenarios that are qualitatively similar to a real crime by adding more levels of anxiety, changing the target item to something of more significance than a ball, and increasing the motivation of the individual to be convincing during the interview. If the ACID method will be used in practical application, it will also be important to study how well members of the investigation field can be trained in these techniques and if it significantly changes the effectiveness of the system. Lastly, further research on the addition of affective detail to the ACID method needs to be performed. A comparison between participants who were prompted to add affective detail to their statement versus those who were not prompted could provide evidence for whether affective details occur naturally in a given statement. Also, the presence of affective details in reports of people with PTSD or others who experience a traumatic or very anxiety-arousing event should be studied. The natural tendency to protect oneself by not

processing emotional content related to such events may seriously diminish the amount of affect reported.

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