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Automating Linguistics-Based Cues for Detecting Deception in Text-based Asynchronous Computer-Mediated Communication

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Abstract

The detection of deception is a promising but challenging task. A systematic discussion of automated Linguistics Based Cues (LBC) to deception has rarely been touched before. The experiment studied the effectiveness of automated LBC in the context of text-based asynchronous computer mediated communication (TA-CMC). Twenty-seven cues either extracted from the prior research or created for this study were clustered into nine linguistics constructs: quantity, diversity, complexity, specificity, expressivity, informality, affect, uncertainty, and non-immediacy. A test of the selected LBC in a simulated TA-CMC experiment showed that: (1) a systematic analysis of linguistic information could be useful in the detection of deception; (2) some existing LBC were effective as expected, while some others turned out in the opposite direction to the prediction of the prior research; and (3) some newly discovered linguistic constructs and their component LBC were helpful in differentiating deception from truth.

Key words: deception, deception detection, linguistics based cue, computer-mediated communication, natural language processing

1. Introduction

Deception generally entails messages and information knowingly transmitted to create a false conclusion (Buller and Burgoon 1994). It is a fact of life that daily communication is rife with various forms of deception, ranging from white lies, omissions, and evasions to bald-faced lies and misrepresentations. Driven by the globalization of economies and advancement of computer technology, computer-mediated communication (CMC) (Wolz et al. 1997) continues to diffuse into our everyday life, bringing with it new venues for deception. CMC can be classified into text, audio, audio/video, and multi-media based formats. Text-based CMC is conducted via transmitting textual information without audio and video signals. Such transmissions may differ in their timeliness of response. Synchronous CMC, such as Instant Messaging, has minimal time delays between message transmissions.

Asynchronous CMC, such as email, allows people to respond to incoming messages at their convenience. If CMC is both text-based and asynchronous, we call it Text-based Asynchronous CMC (TA-CMC). Given little consumption of network bandwidth and much flexibility in time, TA-CMC has gained wider adoption than other types of CMC. For example, there were over 890 million email accounts in the world by the end of 2000, up 67 percent from 1999 (Internet Society; WorldLingo). It is this ubiquitous form of CMC and specifically, the messages contained within the text body of such transmissions, which are the focus of the current investigation.

On the one hand, the ever-increasing volume of information transferred through the Internet simultaneously increases the chances of receiving deceptive messages while making it inefficient and impractical to manually filter and screen such messages. On the other hand, people tend to be truth-biased on assessing messages they receive so that the accuracy of human detection of deception remains little better than chance (Frank and Feeley 2002). Tools that augment human deception detection and thereby increase detection accuracy would therefore prove quite valuable, whether in the realm of low-stakes daily discourse or in high-stakes realms such as law enforcement, employment screening, and national security. By analyzing the messages produced by deceivers and comparing them to those produced by truth-tellers, we hope to verify a number of reliable indicators of deceit that can subsequently be built into software to automate detection. Natural language processing (NLP) is a research area that is intended to use computers to analyze and generate languages that humans use naturally. Some relatively mature NLP techniques enable software to automatically identify linguistics-based cues in texts.

Deception detection in TA-CMC has received little attention in research and field studies so far. The research on the automation of deception detection and on correlates of deception is largely separated. The contexts in which automatic deception detection has been investigated include credit card fraud (Wheeler and Aitken 2000), telecommunication fraud (Fawcett and Provost 1997), and network intrusion (Mukherjee et al. 1994), for example. These studies share the characteristic of structured original data with predefined attributes. Credit card fraud detection is a good example. A pre-determined group of attributes of each credit card transaction stored in a database is employed in discovering fraud patterns. Therefore, some conventional statistics and machine learning techniques, such as outlier detection (Aggarwal and Yu 2001) and case-based reasoning (Wheeler and Aitken 2000), can be directly applied to analyzing the data. However, the data produced in TA-CMC are free texts, which are much less manageable than the structured data due to the lack of standard composition style and common elements of messages. The natural language composition of textual messages adds more complexity and ambiguity to the task of analyzing such data. In order to extend the above-mentioned statistical and machine learning techniques to TA-CMC, we have to first transform messages into some kind of structured format. The structure should capture indicators of deception present in the messages.

As for reliable indicators of deceit, there have been numerous studies examining physiological responses, utilizing behavioral coding with well-trained experts, or applying content-based criteria to written transcripts. In virtually all of these cases, the cues or criteria have been developed for well-trained experts and would be quite difficult for laypersons

to apply. When computerization was applied, coding of a set of cues was performed manually, and the function of the computer was limited to performing statistical analysis on the coded scores (Akehurst et al. 1995; Höfer et al. 1996; Köhnken et al. 1995; Ruby and Brigham 1998; Sporer 1997; Vrij et al. 2000). Our study goes one step closer towards the ultimate goal of automating deception detection by replacing humans with computers in analyzing and rating messages based on promising cues. The indicators, or cues, that discriminate between truthful and deceptive messages can then be used to build profiles and algorithms for the automated detection of deception.

Extant literature in communication, criminology, forensic science, police study, psychology, and psychophysiology offers numerous prospective cues that might be applicable to TA-CMC (Burgoon et al. 1996; Driscoll 1994; Kraut 1978; Porter and Yuille 1996; Sapir 1987; Vrij 2000). Nevertheless, three major issues need to be addressed before adapting the existing cues to deception in TA-CMC. First, most experimental data in the prior research were collected via interview, interrogation, observation, or analysis of written statements of a specific past event. As is pointed out in Crystal (1969), language expression changes along with situational factors, such as speech community, register, genre, text and discourse type. Messages generated in TA-CMC exhibit different types of features than those from face-to-face communication. For example, e-mail is expressed through the medium of writing, though it displays several of the core properties of speech, such as expecting a response, transient, and time-governed. Nevertheless, the Internet language lacks the true ability to signal meaning through kinesic (body posture) and proxemic (distance) features, and this, along with the unavailability of prosodic features, places it at a considerable remove from spoken language (Crystal 2001). Therefore, it is inappropriate to treat e-mail either as spoken language as displayed in interviews or interrogations, or as written language as in written statements. The above comparison between the language in TA-CMC and traditional spoken or written language implies that cues derived from other studies need to be validated before applying them to TA-CMC. There is compelling evidence from prior deception research that a variety of language features, either spoken or written, can be valid indicators of deceit (Buller, Burgoon, Buslig and Roiger 1996; Burgoon, Buller, Afifi and Feldman 1996; Zuckerman et al. 1981). Yet, what kinds of cues from messages in TA-CMC could be used for alerting the recipient that deceit is occurring remains an open question that requires systematic empirical verification.

Secondly, current research demands intensive human involvement in decoding messages. Understanding and learning cues is time-consuming yet still does not necessarily produce consistency among human behavioral coders. Consequently, reliability must be checked before and after coding, and multiple coders are typically needed to ensure high reliability because of the subjectivity of human assessment. An automated approach using text-based cues would necessarily need to center on ones that can be objectively quantified.

Thirdly, among the existing text-based cues (Höfer et al. 1996; Porter and Yuille 1996; Steller and Köhnken 1989), some are strongly context sensitive and must be interpreted on the basis of a specific event, such as *unexpected complications during the incident* (Steller and Köhnken 1989), while others can be operationalized with general linguistic knowledge, such as *self reference* (Höfer et al. 1996). The latter are called linguistics-based cues (LBC).

Compared with other text-based cues, LBC do not suffer from the ground-truth problem—knowing with certainty whether what is being reported is truthful or false. This makes them less dependent upon expert knowledge and experience. Automating deception detection using text-based cues would also need to focus on those LBC that are relatively context-insensitive.

With these parameters in mind, we next review various coding systems from which we nominated cues with high discriminatory potential, present our classification scheme for LBC, then turn to a study in which we tested the effectiveness of 27 indicators in distinguishing messages encoded by truth-tellers from messages encoded by deceivers.

2. Previous work related to text analysis

Textual messages lack facial expressions, gestures, and conventions of body posture and distance, so the text itself is the only source for us to infer personal opinions and attitudes, and verify message credibility. Among the systems for analyzing textual information that have been proposed and accepted in research and/or practice are Criteria-Based Content Analysis (CBCA), Reality Monitoring (RM), Scientific Content Analysis (SCAN), Verbal Immediacy (VI) and Interpersonal Deception Theory (IDT) strategies and tactics. Even though none of them was developed specifically for TA-CMC, they provide the theoretical and evidentiary foundation for the cues included in the current investigation.

2.1. Criteria-based content analysis (CBCA)

CBCA was developed as one of the major elements of Statement Validity Assessment (SVA), a technique developed to determine the credibility of child witnesses' testimonies in trials for sexual offenses and recently applied to assessing testimonies given by adults (Raskin and Esplin 1991). It is based on the Undeutsch hypothesis that a statement derived from memory of an actual experience differs in content and quality from a statement based on invention or fantasy (Steller and Köhnken 1989; Undeutsch, 1989). The findings of recent research reveal that people are able to detect deception above the level that would be expected by chance by utilizing SVA and CBCA (Vrij 2000). CBCA focuses on the presence of specific semantic content characteristics. There are 19 criteria in the original CBCA (Steller and Köhnken 1989) which are grouped into four major categories: general characteristics, specific contents, motivation-related contents, and offense-specific elements. Trained evaluators examine the statement and judge the presence or absence of each criterion.

CBCA has shown some limitations in the application to detecting deception. Many factors may influence the presence of CBCA criteria, such as age of the child witness, cognitive interview, and stressful events (Vrij 2000). As part of SVA is targeted at children, some CBCA criteria do not work for adults (Landry and Brigham 1992). The purpose of CBCA was to detect truths rather than deception, as demonstrated in the evaluation of the

criteria on the testimonies of suspects or adult witnesses who talk about issues other than sexual abuse (Porter and Yuille 1996; Ruby and Brigham 1997; Steller and Köhnken 1989). Moreover, some criteria in CBCA need strong background knowledge about the concerning event in addition to familiarity with CBCA criteria in the validity checking.

2.2. Reality monitoring (RM)

RM was originally designed for studying memory characteristics. It implies that a truthful memory will differ in quality from remembering an event that has been made up. The former is likely to contain perceptual information (visual details, sounds, smells, tastes, and physical sensations), contextual information, and affective information (details about how someone felt during the event), while the latter is likely to contain cognitive operations (such as thoughts and reasoning) (Johnson and Raye 1981). Considering that deception is likely based on imagined rather than self-experienced events, RM has been applied in the context of deception detection. Among the eleven deception studies on the RM criteria (Sporer 1997) surveyed by Vrij (2000), eight showed that spatial and temporal information occurs more frequently in truthful than in deceptive statements, and seven found similar patterns for perceptual information. However, the criteria on cognitive operations were only supported by one study (Hernandez-Fernaud and Alonso-Quecuty 1997). In a crime simulation study (Porter and Yuille 1996), none of the three criteria selected from RM, frequency of verbal hedges, number of self-references, and number of words, was found to significantly differentiate between experiment conditions ranging from completely false to truthful confession. We are reluctant to draw any firm conclusions from such comparisons, as they were conducted in the interrogative context.

RM was found to be more useful for analyzing adults' statements than studying children's because children do not differentiate between ongoing fact and fantasy as clearly as adults do (Lindsay and Johnson 1987). RM might be particularly useful for analyzing statements about events that happened recently rather than a long time ago. People have a tendency to fill in gaps, particularly with imagined events, in order to make their stories sound interesting and coherent. Consequently, differences between perceived and imagined events become smaller when people are asked to put their memories into words (Johnson 1988; Vrij 2000).

2.3. Scientific content analysis (SCAN)

Given the transcript or written statement of a subject, SCAN is able to discriminate between adult criminal investigation statements of doubtful validity and those that are probably accurate (Driscoll 1994). Among the indicators listed in SCAN, some are suggestive of deceit when they are present (Sapir 1987), such as lack of memory and missing links; some are indicative of deception when they are absent, such as connections, spontaneous corrections, first person singular and other pronouns, past tense verbs, denial of allegations, unnecessary links, and changes in language; and others are contingent upon where they

occur, such as emotion and time. Due to such complexity in assessing a statement, it is recommended to pay extreme caution when multiple issues may be involved (Driscoll 1994).

A field study (Smith 2001) found that officers who used the SCAN technique, and those untrained officers who drew upon their experience as detectives to assess the statements, were all able to correctly identify at least 80% of the truthful statements and 65% of the deceptive statements. The officers who had not received SCAN training and used their general intuition to assess the statements were only able to correctly assess 45% of deceptive statements. However, an analysis of the use of SCAN criteria used by different assessors revealed low levels of consistency (Smith 2001). The written statement must be made without assistance from any other individual in order for SCAN to be effective.

2.4. Interpersonal deception theory (IDT) strategies and tactics

IDT (Buller and Burgoon, 1996) was developed to explain and predict deception and its detection in interpersonal contexts. As part of that theory development, Buller and Burgoon (1994), Burgoon, Buller, Guerrero, Afifi, and Feldman (1996; see also Jacobs, Brashers, and Dawson 1996, and McCornack 1992) proposed a series of general strategies and specific tactics that deceivers may employ to manage the information in their messages and to evade detection. Tests of IDT (e.g., Buller, Burgoon, Buslig, and Roiger 1994, 1996; Burgoon et al. 1996), along with prior research and a recent meta-analysis (DePaulo, Lindsay, Malone, Muhlenbach, Charlton, and Cooper 2003), have served to clarify what strategies and specific verbal indicators may be valid. They can be summarized as follows:

(a) *quality (truthfulness) manipulations* – deceivers may opt to deviate from the truth completely or partially. Half-truths and equivocations may be deceptive through the inclusion of adjectives and adverbs that qualify the meaning in statements. Other strategies below may further result in receivers drawing wrong inferences about the true state of affairs.

(b) *quantity (completeness) manipulations* – deceivers may be more reticent and less forthcoming than truth-tellers. They may exhibit reticence by using fewer words and sentences or less talk time than truth-tellers. Their messages may be incomplete syntactically, by giving perceptually less information than would normally be expected as a response, or semantically, by failing to present actual detailed content such as factual statements. Deceivers' language describing imagined events may also fail to reflect the rich diversity of actual events, as noted in CBCA and RM. Thus, two extensions of the concept of reduced completeness may include reduced content specificity and reduced lexical (vocabulary) and content diversity.

(c) *clarity (vagueness and uncertainty) manipulations* – deceivers' messages may be less clear by virtue of using contradictory or impenetrable sentence structures (syntactic ambiguity) or by using evasive and ambiguous language that introduces uncertainty (semantic ambiguity). Modifiers, modal verbs (e.g., should, could), and generalizing or "allness" terms (e.g., "everybody") may increase uncertainty.

(d) *relevance manipulations* – deceivers may give responses that are semantically indirect (e.g., forms of polite speech) or irrelevant (such as irrelevant details). They may also be syntactically indirect (e.g., following a question with a question).

(e) *depersonalism (disassociation) manipulations* – deceivers may use language to distance themselves from their messages and the contents of those messages. Nonimmediate language (described more fully below) such as lack of pronouns, especially first person pronouns, and use of passive voice reduce a sender's ownership of a statement and/or remove the author from the action being described. Other linguistic features such as use of more second person pronouns may imply dependence on others and lack of personal responsibility.

(f) *image- and relationship-protecting behavior* – "verbal and nonverbal behaviors used to make oneself appear sincere and trustworthy and to sustain the self-presentation one has created" (Buller and Burgoon 1994, p. 204). Verbal tactics may include avoidance of discrediting information (e.g., admitted lack of memory, expressions of doubt) and avoidance of negative affect in one's language (partially intended to cover any accidental betrayal of true feelings of guilt, fear of detection, etc.).

These strategies and tactics together point to a number of plausible text-based indicators of deception that may, despite deceivers' efforts to the contrary, reveal their deceptive intent. For example, the withdrawal and distancing associated with quantity and depersonalism manipulations may result in an overall pattern of uninvolvement that itself may give deceivers away. Other indicators that are nonstrategic (i.e., unintended) – such as cues related to nervousness, arousal, tension, negative affect, and incompetent speech performance – include mostly nonverbal cues. Two exceptions, unpleasantness and inexpressiveness, may also manifest themselves through use of adverbs and adjectives that express negative feeling states and attitudes and through less expressive or intense language.

2.5. Verbal immediacy (VI)

VI was originally proposed as a means of inferring people's attitude or affect (Mehrabian and Wiener 1966). The general construct of *immediacy-nonimmediacy* refers to verbal and nonverbal behaviors that create a psychological sense of closeness or distance. Verbal *nonimmediacy* thus encompasses any indication through lexical choices, syntax and phraseology of separation, non-identity, attenuation of directness, or change in the intensity of interaction between the communicator and his referents. The basic principle of assessing VI is via a literal interpretation of the words rather than their connotative meanings (Wiener and Mehrabian 1968). For example, while "you and I selected" may be equivalent to "we selected" in meaning, the former is considered more nonimmediate than the latter.

VI can be classified into three major categories: spatio-temporal, denotative specificity, and agent-action-object categories, each of which is further broken down into many subcategories (Wiener and Mehrabian 1968). VI has been applied to conversation analysis and coded on a scale with positive scores signifying approach and negative scores signifying avoidance (Borchgrevink unpublished; Donohue 1991). Avoidance is indicated by some nonimmediacy sub-categories, such as spatial and temporal terms, passive voice, presence of modifiers, and other expressions such as volitional words, politeness, and automatic phrasing. Detailed criteria for scoring nonimmediacy result in positive and negative scores assigned for the presence of each attribute. These are summed so that the higher the nega-

tive score for any utterance, the greater the probability that it is part of a communication about a negative experience or intended to distance the communicator from the listener and/or the message itself (Mehrabian and Wiener 1966). Since deception is frequently associated with negative affect and/or attempts to disassociate oneself from one's communication, VI measures are plausible indicators of deceit.

Many other individual studies and meta-analyses (DePaulo et al. 1985, 2003; Zuckerman et al. 1981) that covered certain kind of cues from texts could be mentioned here, but they largely have their origins in one of the above criteria or theories.

In summary, the review of literature clarifies that many aspects of text, such as content and style, have been employed as cues to deception. It should be emphasized that many of the above-mentioned criteria were developed for interrogation or interview contexts. The subjects in the experiments and the witnesses or suspects in the field studies were asked to describe or answer questions about a specific past event or experience, making such cues as temporal and spatial information, perceptual information, and quantity of details applicable. In TA-CMC, people are also likely to discuss some ongoing events or future decisions. With this change of context, we need to validate what cues may still be appropriate for TA-CMC and what factors may alter the previously discovered patterns. Furthermore, the emerging capacities of natural language processing, coupled with the principles of VI, open opportunities to discover new cues to deception in TA-CMC.

2.6. Linguistics based cues (LBC) and natural language processing (NLP)

LBC are involved with linguistic information in text unit(s), including words, terms, phrases, sentences, or an entire messages. A term is defined as a meaningful unit that consists of one or more content words and has distinct attributes (Zhou et al. 2002), whereas a phrase is composed of multiple words and/or terms. Many LBC can be extracted from the aforementioned criteria and constructs: contextual embedding in CBCA (Steller and Köhnken 1989); affective information in RM (Johnson and Raye 1981); first person singular pronouns and denial of allegations in SCAN (Sapir 1987); and spatio-temporal information and passive voice in VI (Wiener and Mehrabian 1968). As is evident from Table 1, previous approaches show some overlap. We have therefore synthesized these to produce a more parsimonious list of LBCs that are amenable to automation. Because past research has re-

Table 1. A sample list of LBC, their sources and depth of analyses

Cues	Sources	Depths of analyses
Passive voice	VI	Mo, Sy
Self reference	RM, SCAN	Mo
Negative statements	VI, SCAN	Mo, Sy, Ls
Generalizing terms	VI	Mo, Ls
Uncertainties	VI	Mo, Ls
Temporal information	CBCA, RM, VI	Mo, Sy, Ls
Spatial information	CBCA, RM, VI	Mo, Sy, Ls
Affect	RM, VI	Mo, Ls

lied on very time-consuming manual behavioral coding by human judges and because many cues require subjective interpretation that may vary substantially from one judge to the next, we turned to NLP techniques to assist with automating cue identification.

NLP enables people to communicate with machines using natural communication language by automatically analyzing and understanding human language with computers. Inspired by the process of human language understanding (breaking down larger textual units into smaller ones and integrating the understanding of small units into that of the whole text), NLP analyzes texts by going through sub-sentential, sentential, and discourse processing. Based on depth of analysis, the sub-sentential processing can be further classified into phonological analysis, morphological analysis, syntactic parsing, semantic analysis, and so on. Since the phonological analysis is usually performed on speech rather than written text, it is beyond our consideration in this study. Morphological analysis attempts to determine the part-of-speech of each word in a sentence, while syntactic parsing looks for the structure of a sentence following certain syntactic grammar. Full syntactic parsing into a hierarchical tree structure is not always necessary and may produce many ambiguous results; therefore, shallow parsing, extracting only the syntax one needs from a sentence, has gained popularity in practice. A shallow parser may identify some phrasal constituents, such as noun phrases, without indicating their internal structures and their functions in the sentence (Karlsson and Karttunen 1997). Semantic and discourse analyses dig deeper into the meaning and context and are very complex and difficult to automate. Therefore, we temporarily ignored LBC that require these two types of analyses except for those involving limited lexical semantic processing dealing with meaning of word(s). As a result, we focus on LBC that are involved with Morphological (Mo), Syntactic (Sy) and Lexical Semantic (Ls) analyses in this study (in short, MoSyLs). All the cues listed in Table 1 belong to these types. The third column in Table 1 also records the NLP analyses, noted in shorthand by the first two characters, that can be performed to identify a specific cue. For example, *temporal information* drawn from CBCA, RM, SCAN, and VI requires morphological, syntactic and lexical semantic analyses to automatically identify.

Most of prior studies combine LBC with other types of cues in detecting deception in face-to-face settings. What remains theoretically challenging is how applying pure LBC to deception would work in TA-CMC. We began by identifying the most promising MoSyLs cues from existing criteria and constructs, then merged them into a candidate cue list for testing in a TA-CMC simulation study. Encouraged by the research on stylistic analysis as a predictor of newspaper credibility (Burgoon et al. 1981), we added three other stylistic indices: complexity, pausality, and emotiveness. Complexity can be measured as the ratio of syllables to words or characters to words. Pausality, or amount of punctuation, may also be an indication of degree of sentence complexity. Emotiveness is the ratio of adjectives plus adverbs to nouns plus verbs, which was selected as an indication of expressivity of language. To measure actual emotional and feeling states, we included the amount of positively or negatively valenced terminology included in the messages and differentiated between positive and negative affect to determine if the total amount of affect or the valence of the affect made a difference. Finally, in TA-CMC, typos are both unavoidable and easily correctable if wanted. Thus, typos in a message may reflect informality of language in the communication, which might be another useful aspect to view deceptive messages.

2.7. Hypotheses

In building our hypotheses to test automated LBC for detecting deception in messages created in TA-CMC, our overriding premise was that LBC improves the performance of deception detection in general. Thus, we expected linguistic indicators to successfully discriminate between deceivers and truth-tellers.

Based on the preceding literature review, we might normally expect deceivers to minimize the amount of information that is presented and that could later be verified and determined to be deceptive. We might also expect some cognitive difficulty associated with deceit that could limit the amount and quality of discourse being presented and result, for example, in repetitive phrasing and less diverse language. Due to the possible arousal of guilty feelings, deceivers might be expected to take a low-key, submissive approach, to disassociate themselves from their messages through a higher degree of nonimmediacy, and to inadvertently reveal negative affect. We might expect more passive voice, modal verbs, objectification, other indicators of uncertainty, generalizing terms, fewer self-references, and more group references as means of increasing uncertainty and vagueness and as further disassociation. Due to over-control and less conviction about what is being said, the expressiveness of the language of deceptive senders might also be expected to be lower than truthful senders and to include less positive affect or less affect altogether. In order to create a sense of familiarity, which should activate positive biases, deceivers might show higher informality of language than truth-tellers.

Our conjectural language is due to the fact that the nature of TA-CMC and the task being used may alter many of these predictions. With regard to TA-CMC, several factors related to a reduction in interactivity argue against some of the above patterns (Burgoon, Bonito and Stoner 2003). First, participants interact at a distance, and proximity or lack of it is a big factor in how people relate to one another. At a distance, participants feel less connected to one another and therefore deceivers may experience less negative emotions about deceiving. Deceivers may even go to the other extreme by showing a positive state of mind on their falsified opinions in order to achieve their communication goal with remote partners. Second, the text medium gives deceivers fewer modalities to control and therefore more opportunities to attend carefully to the one modality they must monitor. Third, asynchronicity enables greater control and forethought, greater time for deceivers to plan, rehearse and edit what they say. This can reduce the cognitive difficulty of the task as well as the anxiety associated with answering "on the fly."

With regard to the task itself, deceptive senders were given the goal of convincing receivers to make decisions contrary to what they knew to be correct. The fact that the task was a persuasive one, one requiring deceivers to generate arguments and "evidence" to support their claims if they were to succeed, introduced a major change from previous experiments and raised the distinct possibility that deceivers would generate more, not less, discourse as part of advancing their arguments in behalf of their position. Research by Burgoon, Blair and Moyer (2003) had found that deceivers in their experiment were more motivated than truth-tellers to succeed in appearing truthful and that text communication was not particularly taxing. Thus we thought deceivers under TA-CMC might actually

produce longer (higher quantity) messages than truth-tellers. Moreover, a decision-making task with a strong persuasive component in it demands increasing expressiveness of deceivers' language in order to enhance the persuasiveness of their opinions, and use of positively valenced adjectives and adverbs (e.g., "great") and informal language might be especially useful both in building rapport and in reducing the appearance of trying to manipulate the partner. We reasoned that complexity, diversity, and specificity might still be limited, however, due to some continued cognitive taxation and lack of reliance on real memory. People commonly deceive by concocting lies or being equivocal and evasive. In the former case, the messages lack the support of rich and real memory, so they tend not to include specific details and lack language to refer to said same. In the latter case, deceivers may deliberately leave out specific details. In either case, the complexity, diversity, and specificity of language of senders in the deception condition should be lower than those in the truth condition. We also expected that senders would continue to introduce uncertainty in their language and disassociate themselves from their messages through nonimmediacy.

Hypothesis 1. Deceptive senders display higher (a) quantity, (b) expressivity, (c) positive affect, (d) informality, (e) uncertainty, and (f) nonimmediacy, and less (g) complexity, (h) diversity, and (i) specificity of language in their messages than truthful senders.

Inasmuch as language used by a sender has impact on that of the receiver, the issue of deception in interpersonal contexts can be approached from a dyadic and dialogic rather than monadic and monologic perspective, as suggested in IDT (Buller and Burgoon 1996). In our experiment, we labeled the initiator of a communication as the sender and the other party as the receiver. Senders were assigned to the truthful or deceptive condition, but receivers in both conditions were presumably truthful. Thus we could examine deceptive versus truthful discourse in two ways: by comparing deceptive senders to truthful senders (i.e., independent group comparisons) and by comparing deceptive senders to their truthful receivers (i.e., within-group comparisons). The second hypothesis thus extended the comparison of deceptive and truthful senders to that of deceptive senders and naïve (truthful) receivers:

Hypothesis 2. Deceptive senders display higher (a) quantity, (b) expressivity, (c) positive affect, (d) informality, (e) uncertainty, and (f) nonimmediacy, and less (g) complexity, (h) diversity, and (i) specificity of language in their messages than their respective receivers.

3. Method

The research experiment was a 2×2 repeated measures design varying experimental condition (deception, truth) and dyad role (sender, receiver). Participants were assigned one of the two roles in one of the two conditions and performed a task for three consecutive days under the same condition.

3.1. Participants

Participants (N = 60) were freshmen, sophomore, junior, and senior students (57% female, 42% male) recruited from a Management Information Systems course at a large southwestern university who received extra credit for experimental participation. Ranking grade level from low to high as 1 to 4, the average grade of completed subjects was 3.12. Failure to comply with the full requirements over the course of the entire experiment resulted in attrition, with 30 dyads successfully completing the entirety of the experiment. Among the 30 dyads, 14 were collected from the truth condition, and 16 from the deception condition. The messages from each subject were aggregated across three days to derive stable estimates.

3.2. Procedures

Participants completed the experiment by logging onto a designated web server from either labs on campus or from home. They were randomly assigned to two-person groups (dyad) and the dyads were randomly assigned to treatments depending on the order they logged in. Within dyads, participants were randomly assigned the role of "sender" or "receiver."

The task consisted of a modified version of the Desert Survival Problem (Lafferty and Eady 1974). The modified version presented participants with a scenario in which their jeep had crashed in the Kuwaiti desert and their primary goal was to achieve, through discussion, a consensus ranking of 12 items they should salvage in terms of their usefulness to survival. The task in the experiment was carefully selected to meet several criteria. First, it elicited high involvement by participants. Second, the experiment occurred in a natural setting, where subjects typically communicate with each other, increasing ecological validity. Third, it created opportunities for deception in exchanging electronic messages. Fourth, the single task was clearly defined in the instructions and supplemented with additional background knowledge. Fifth, the experiment was supported by an integrated system, which is embedded with flow control of the entire procedure, helping subjects interpret the task consistently and perform the task easily. Last but not least, it went beyond the traditional paradigm of structured interviews to the kind of decision-making task relevant to group work.

A list of *n* (10–12) salvageable items was available, depending on the scenario. Participants in each dyad exchanged their ideas by sending messages to each other via an email messaging system. Each sender first ranked the items based on his or her own truthful or deceptive opinion, composed an email message presenting his or her ranks and reasoning, and sent the email to the receiver within a half-day time slot. Each receiver read the message from his or her sender, re-ranked the items if necessary, and wrote a response to the sender within the given time slot. The senders started to receive messages from their partner from the second half day. The sender and receiver in each dyad communicated back and forth once for each of the three consecutive days before reaching a final decision. Deceptive senders were given special instructions on deceiving their partners when they first logged in, while truthful senders were instructed to offer their true opinions to their

partners. None of the receivers was informed of the senders' condition during the experiment. They were only told to collaborate with their partner to complete the decision-making task. Additionally, the system did not reveal the identities of the subjects to their partners, protecting anonymity.

On the second and the third days of the task, a random scenario was given to each dyad where one of items was removed from consideration. These items were removed to elicit discussion between the partners and give the task a sense of realism and urgency. The scenarios included such events as the dyad's water being spilled or the plastic sheeting being blown away in a storm.

The study was performed entirely using a web-based messaging system. Volunteers were given a web-site address and instructed on when to begin. The subjects completed each day's task by logging into the system from any web-enabled computer. Although performing the study using a web-based messaging system outside of the laboratory reduced the amount of experimental control that could be exercised, it allowed the subjects to perform the tasks at their convenience without the pressures and unnatural feel of the laboratory.

3.3. Independent variables

3.3.1. Dyad

Participants were randomly assigned to the (arbitrarily labeled) sender or receiver role. Senders were the participants who initiated the online communication. Receivers were the other member of each dyad and were the first to receive a message and reply to it. Due to the close relationship between a received messages and the corresponding response, sender and receiver behavior were not independent of one another, resulting in the need to treat dyad membership as a repeated, or within- , factor in the statistical design.

3.3.2. Deception condition

Senders were randomly assigned to the deception or truth condition. In the deception condition, senders were explicitly instructed to deceive the receiver about how they ranked the items; in the truth condition, senders offered their true opinions to the receiver.

3.4. Dependent variables and measures

Based on prior studies, the linguistic features of messages in TA-CMC, and the possibility of automation, we selected 27 LBC as dependent variables. Considering the correlations between some dependent variables, we grouped the LBC into eight linguistic constructs: quantity, complexity, uncertainty, nonimmediacy, diversity, affect, specificity, expressiveness, and informality. All the linguistic constructs and their component dependent variables and measures are summarized in Table 2.

A shallow parse was sufficient for identifying the LBC selected in this experiment. We adopted an NLP tool called iSkim (Zhou et al. 2002), which combines the accuracy of the EngCG-2 morphological tagger (Samuelsson and Voutilainen 1997; Voutilainen 2000) with

Table 2. Summaries of linguistic constructs and their component dependent variables and measures

Quantity

1. Word [a]: a written character or combination of characters representing a spoken word.

2. Verb [a]: a word that characteristically is the grammatical center of a predicate and expresses an act, occurrence, or mode of being.

3. Noun phrase [a]: a phrase formed by a noun, its modifiers and determiners.

4. Sentence [a]: a word, clause, or phrase or a group of clauses or phrases forming a syntactic unit which expresses an assertion, a question, a command, a wish, an exclamation, or the performance of an action, which usually begins with a capital letter and concludes with appropriate end punctuation.

Complexity

5. Average number of clauses: $\frac{\text{total \# of clauses}}{\text{total \# of sentences}}$

6. Average sentence length: $\frac{\text{total \# of words}}{\text{total \# of sentences}}$

7. Average word length: $\frac{\text{total \# of characters}}{\text{total \# of words}}$

8. Average length of noun phrase: $\frac{\text{total \# of words in noun phrases}}{\text{total \# of noun phrases}}$

9. Pausality: $\frac{\text{total \# of punctuation marks}}{\text{total \# of sentences}}$

Uncertainty

10. Modifiers [b]: describes a word or makes the meaning of the word more specific. There are two parts of speech that are modifiers - adjectives and adverbs.

11. Modal verb [a]: an auxiliary verb that is characteristically used with a verb of predication and expresses a modal modification.

12. Uncertainty: a word that indicates lack of sureness about someone or something [a].

13. Other reference: third person pronoun.

Nonimmediacy[c]

14. Passive voice: a form of the verb used when the subject is being acted upon rather than doing something.

15. Objectification [a]: an expression given to (as an abstract notion, feeling, or ideal) in a form that can be experienced by others and externalizes one's attitude.

16. Generalizing terms: refers to a person (or object) as a class of persons or objects that includes the person (or object).

17. Self reference: first person singular pronoun.

18. Group reference: first person plural pronoun.

Expressivity

19. Emotiveness: $\frac{\text{total \# of adjectives + total \# of adverbs}}{\text{total \# of nouns + total \# of verbs}}$

Diversity

20. Lexical diversity: $\frac{\text{total \# of different words or terms}}{\text{total \# of words or terms}}$, which is the percentage of unique words or terms in all words or terms.

Table 2. Continued

21. Content word diversity: $\frac{\text{total \# of different content words or terms}}{\text{total \# of content words or terms}}$, where content words or terms primarily express lexical meaning.

22. Redundancy: $\frac{\text{total \# of function words}}{\text{total \# of sentenses}}$, where function words express primarily grammatical relationships.

Informality
23. Typographical error ratio: $\frac{\text{total \# of misspelled words}}{\text{total \# of words}}$

Specificity[c]
24. Spatio-temporal information: information about locations or the spatial arrangement of people and/or objects, or information about when the event happened or explicitly describes a sequence of events.
25. Perceptual information: indicates sensorial experiences such as sounds, smells, physical sensations and visual details
Affect[c]
26. Positive affect[a]: conscious subjective aspect of a positive emotion apart from bodily changes.
27. Negative affect[a]: conscious subjective aspect of a negative emotion apart from bodily changes.

a: Source of definition: *www.webster.com*
b: Source of definition: *http://englishplus.com/grammar/glossary.htm*
c: Individual measures in the construct are calculated per message unit, i.e. frequency counts divided by the total number of words, to adjust for differential message lengths.

the information produced by EngLite syntax (http://www.conexoroy.com/lite.htm) and named entity extraction. Some types of named entities, such as location and time, were directly related to the selected LBC. The software provided critical information for measuring the LBC in Table 2. Based on iSkim's output, another tool, CueCal, was developed to derive the value of each individual cue. For example, the cue *lexical diversity* was measured using the following steps: iSkim first reduced all the words that have inflectional changes into their base forms (stems), and then CueCal identified terms in addition to words, counted the total number of words or terms as well as unique words or terms, and finally divided the latter by the former to derive the value of lexical diversity.

4. Results

Hypotheses were tested with 2 × 2 repeated-measure analyses of variance. Multivariate analyses were initially conducted on sets of related variables, followed by simple effect tests on the 27 individual dependent variables. Dyad was set to sender in testing the simple effect of deception in Hypothesis 1 and condition was set to deception in testing the simple effects of dyad in Hypotheses 2. Table 3 lists the means and standard deviations of all dependent variables.

Table 3. Means (standard deviations) for LBC (dependent measures)

Cues	Condition*	Sender	Receiver
Word	T	272.4[124.3]	273.5[142.7]
	D	391.3[123.5]	329.7[137.6]
Verb	T	56.8[28.5]	58.3[38.3]]
	D	92.9[29.7]	71.5[33.8]
Noun phrase	T	97.5[49.8]	96.2[54.8]
	D	132.7[39.6]	110.8[48.3]
Sentence	T	18.8[10.3]	21.2[12.5]
	D	25.8[8.9]	19.6[9.0]
Modifier	T	29.6[14.7]	32.1[17.2]
	D	48.3[19.5]	34.8[16.5]
Modal verb	T	0.057[0.026]	0.046[0.028]
	D	0.073[0.02]	0.05[0.015]
Uncertainty	T	0.013[0.013]	0.014[0.012]
	D	0.012[0.012]	0.011[0.009]
Other reference	T	0.007[0.009]	0.004[0.005]
	D	0.003[0.005]	0.005[0.007]
Passive voice	T	0.015[0.01]	0.013[0.01]
	D	0.018[0.013]	0.015[0.013]
Objectification	T	0.009[0.012]	0.008[0.01]
	D	0.008[0.009]	0.008[0.01]
Generalizing term	T	0.028[0.016]	0.028[0.017]
	D	0.021[0.015]	0.017[0.01]
Self reference	T	0.035[0.029]	0.035[0.027]
	D	0.022[0.016]	0.033[0.022]
Group reference	T	0.016[0.013]	0.019[0.015]
	D	0.03[0.023]	0.02[0.015]
Emotiveness	T	0.272[0.085]	0.304[0.108]
	D	0.289[0.06]	0.249[0.089]
Avg. number of clauses	T	0.95[1.0]	0.55[0.32]
	D	0.55[0.25]	0.62[0.44]
Avg. sentence length	T	19.6[15.0]	16.1[8.8]
	D	15.2[4.6]	17.3[5.5]
Avg. word length	T	3.9[0.22]	3.9[0.22]
	D	4.0[0.24]	3.9[0.15]
Avg. NP length	T	1.7[0.27]	2.3[2.4]
	D	1.7[0.17]	2.0[1.4]
Pausality	T	3.1[2.2]	2.9[2.4]
	D	1.9[0.53]	2.8[1.9]

Table 3. Means (standard deviations) for LBC (dependent measures)

Cues	Condition*	Sender	Receiver
Typographical error ratio	T	0.005[0.008]	0.006[0.008]
	D	0.01[0.007]	0.01[0.008]
Lexical diversity	T	0.719[0.073]	0.719[0.111]
	D	0.637[0.074]	0.679[0.107]
Content diversity	T	0.732[0.089]	0.737[0.118]
	D	0.641[0.088]	0.70[0.093]
Redundancy	T	7.507[6.525]	5.972[3.791]
	D	5.501[1.871]	6.336[2.176]
Spatio-temporal information	T	0.043[0.012]	0.047[0.022]
	D	0.047[0.018]	0.048[0.016]
Perceptual information	T	0.015[0.011]	0.016[0.011]
	D	0.018[0.011]	0.02[0.012]
Positive affect	T	0.004[0.005]	0.007[0.007]
	D	0.009[0.007]	0.006[0.006]
Negative affect	T	0.003[0.005]	0.003[0.005]
	D	0.004[0.004]	0.002[0.002]

*T: truth condition; D: deception condition

Hypothesis 1 received support on numerous measures. The multivariate analysis on *quantity* measures showed that messages from deceptive senders were significantly different from those from truthful senders on quantity, Wilk's $\lambda = 0.607$, $F(4, 25) = 4.043$, $p = 0.012$, $\eta^2 = 39.3\%$. Compared with truthful senders, deceptive senders used more words, $F(1,28) = 6.877$, $p = 0.014$, verbs, $F(1,28) = 11.446$, $p = 0.002$, noun phrases, $F(1,28) = 4.644$, $p = 0.040$, and sentences, $F(1,28) = 4.054$, $p = 0.054$ (equivalent one-tailed p-value = 0.028). A univariate analysis on *informality*, $F(1, 28) = 3.89$, $p = .058$, $\eta^2 = 12\%$, was significant as a directional test (i.e., a t-test at $p < 0.05$, one-tailed). Deceivers used more informality in the form of more typographical errors. The multivariate analysis was likewise significant on *diversity* measures, Wilk's $\lambda = 0.717$; $F(3, 26) = 3.58$, $p = 0.027$, $\eta^2 = 29\%$, and *uncertainty* measures, Wilk's $\lambda = 0.658$; $F(4, 25) = 3.242$, $p = 0.028$, $\eta^2 = 34.2\%$. As predicted, deceivers displayed less lexical diversity, $F(1, 28) = 9.322$, $p = 0.005$, and content diversity, $F(1, 28) = 8.116$, $p = 0.008$, and more modifiers, $F(1,28) = 8.55$, $p = 0.007$, and modal verbs, $F(1, 28) = 3.88$, $p = 0.059$ (equivalent one-tailed p-value = 0.029), than truthful senders. The multivariate effect for *affect* failed to achieve conventional levels of significance, $F(2, 27) = 2.85$, $p = 0.07$, $\eta^2 = 17\%$, but the follow-up univariate analyses showed that deceptive senders produced more positive affect, $F(1, 28) = 5.27$, $p = 0.029$, than truthful senders. The multivariate tests on *complexity*, $F(5, 24) = 1.30$, $p = 0.297$, *nonimmediacy*, $F(5, 24) = 1.746$, $p = 0.162$, *specificity*, $F(2, 27) = 0.60$, $p = 0.58$, and *expressivity*, $F(1, 28) = 0.43$, $p = 0.517$, respectively, also failed to yield significant results. However, the univariate analyses revealed that compared with truthful senders, deceptive senders created signifi-

cantly less pausality, $F(1, 28) = 4.63$, $p = 0.04$; and used more group references, $F(1, 28) = 4.15$, $p = 0.051$ (equivalent one-tailed p-value = 0.025), than truthful senders. Thus, as hypothesized, deceptive senders created longer, more informal, more uncertain and nonimmediate, less complex, and less diverse messages than truth-tellers.

As predicted in Hypotheses 2, multivariate analyses within dyads produced differences between deceptive senders and their truthful partners on *affect*, Wilk's $\lambda = 0.49$; $F(2, 14) = 7.38$, $p = 0.006$, partial $\eta^2 = 51\%$; *uncertainty*, Wilk's $\lambda = 0.225$; $F(4, 12) = 10.362$, $p = 0.001$, partial $\eta^2 = 77.5\%$; and *expressivity*, Wilk's $\lambda = 0.72$; $F(1, 15) = 75.88$, $p = 0.028$, partial $\eta^2 = 28\%$; and produced a near-significant effect on *diversity*, Wilk's $\lambda = 0.61$; $F(3, 13) = 2.75$, $p = 0.085$, partial $\eta^2 = 39\%$. The follow-up univariate analyses showed that compared with truthful partners, deceptive senders showed greater uncertainty in the form of modifiers, $F(1,15) = 8.93$, $p = 0.009$; and modal verbs, $F(1, 15) = 44.04$, $p < 0.001$. In addition, their language displayed more negative affect, $F(1, 15) = 7.35$, $p = 0.016$, and emotiveness, $F(1, 15) = 5.88$, $p = 0.028$, but had lower lexical diversity, $F(1, 15) = 6.62$, $p = 0.021$, and content diversity, $F(1, 15) = 8.46$, $p = 0.011$. Although analyses failed to produce significant multivariate differences on *quantity*, $F(4, 12) = 2.023$, $p = 0.155$; *nonimmediacy*, $F(5, 11) = 1.543$, $p = 0.255$; *specificity*, $F(2, 14) = 0.194$, $p = 0.825$; *complexity*, $F(5, 11) = 1.66$, $p = 0.225$; or *informality,* $F(1, 15) = 0.001$, $p = 0.981$, univariate analyses showed that relative to their non-deceptive partners, deceptive senders produced more language in the form of more words, $F(1, 15) = 3.278$, $p = 0.09$ (equivalent one-tailed p-value = 0.045); sentences, $F(1, 15) = 3.567$, $p = 0.078$ (equivalent one-tailed p-value = .039), and verbs, $F(1,15) = 5.92$, $p = 0.028$; and they were lower on pausality (complexity) than receivers, $F(1, 15) = 3.78$, $p = 0.071$ (equivalent one-tailed p-value = 0.035). Their language was also more nonimmediate, as shown by fewer self references, $F(1, 15) = 3.585$, $p = 0.078$, and more group references, $F(1, 15) = 3.675$, $p = 0.074$ (equivalent one-tailed p-values = 0.039 and 0.037). In sum, Hypothesis 2 received substantial support. Deceivers exhibited greater expressivity, uncertainty, quantity, and nonimmediacy, and lower complexity and diversity. Contrary to expectations, but consistent with prior research, deceivers showed more negative rather than positive affect, and specificity failed to emerge as a discriminator.

5. Discussion

5.1. Major findings

This investigation sought to determine the viability of using LBC to distinguish truthful from deceptive messages. Taken together, our two hypotheses received considerable support for all classes of linguistic features studied except specificity. Consistent with our hypothesis but contrary to much prior research, deceivers displayed higher quantity – of words, verbs, noun phrases, and sentences. Their messages were also more expressive than their partners and they appeared more informal, as they had more typographical errors than truth-tellers. Consistent with other research and our hypotheses, deceptive subjects in this study displayed less diversity at both the lexical and content level than did truth-tellers.

They also used nonimmediate and uncertain language in the form of less self-reference, more group references, more modal verbs, and more modifiers. Moreover, their messages were less complex, as evident by less punctuation (pausality). One anomaly was that, although affective references were higher by deceivers, the between-groups comparison showed more positive affect, whereas the within-dyads comparison showed more negative affect, leading to the very tentative conclusion that deceivers in general used more affective language. Finally, specificity in terms of spatio-temporal or perceptual references was not found to vary between truth-tellers and deceivers, although that might be attributable to our reliance on an as-yet very small dictionary of spatio-temporal and perceptual terms.

How do these results compare with prior investigations? The greater quantity of language runs contrary to IDT's prediction of deceivers typically opting to say less, and the greater expressivity is counter to past face-to-face findings showing deceivers to be nondemonstrative and inexpressive. The uncertainty and nonimmediacy are consistent with general strategies of obfuscation and equivocation. The trend that deceivers showed more affective information than truth-tellers runs contrary to what has been found in RM investigations, and the lack of evidence in support of spatio-temporal information was contrary to the prediction in CBCA, RM, and VI. However, virtually all of the differences between this experiment's findings and those of prior investigation can be laid at the feet of the unique characteristics of asynchronous, distributed, text-based communication and the specific task. Unlike interviews, in which respondents must construct answers spontaneously in real time, with little opportunity for prior planning, rehearsal, or editing, deceivers in this investigation had ample opportunity to create and revise their messages so as to make them as persuasive as possible. Additionally, unlike interviews requiring narratives about specific events, the task was an advocacy one that required participants to offer their opinions and to give reasons for their recommendations, a task likely to elicit more rather than less discourse and with little concrete basis for partners to suspect duplicity.

Some LBC that were advanced in this investigation have not been considered previously. These include complexity, expressivity, informality, and content diversity, all of which were found effective in distinguishing truthful from deceptive messages. Additionally, the enrichment of the quantity construct with verb and noun phrase quantities in addition to word quantity greatly increased the distinction between experimental conditions. The importance of breaking down affect into positive and negative categories was illustrated by the fact that only positive affect could significantly differentiate between truthful and deceptive senders, and only negative affect could differentiate between senders and receivers in the deception condition.

While the majority of dependent constructs and LBC in Table 2 were found effective to detect deception in this study, some specific indicators such as passive voice, objectification, generalizing terms, other references, and redundancy were not effective discriminators in this study. It is possible that these indicators will not prove to be reliable cues to deception, possibly because some are easy for deceivers to readily manipulate in a TA-CMC setting and thus to approximate the language of truth-tellers. However, it may be that under different contexts and tasks, they will emerge as relevant and should therefore not be discounted at this early stage of investigating LBC. We can infer from the above results that diversity,

uncertainty, quantity, and affect constructs were relatively robust and were applicable to distinguishing deceivers from both truthful senders and receivers, whereas other constructs may only be effective in at most one of the above comparisons. In view of the level of interaction between senders and receivers and the type of deception task, we can clearly see that detecting deception is an extremely complex task, with many dynamic and contextual factors.

5.2. Implications for automating deception detection

Despite its complexity, automating deception detection with accuracy beyond the level of chance is still a reachable goal as further research yields more effective cues and technology advances allow for the use of more complex cues. The significant results from the computer-generated measures used in this study demonstrate that a computational approach is a valid one in tapping the various variables being examined. Given a list of computerized cues and their preferable conditions, deception detection could become available to laypersons.

The identification of cues to deception is the first step in automating deception detection. It is especially important to identify those cues that can easily be implemented using current technology. Cues, such as identifying logical inconsistencies, that require specific domain knowledge or deep semantic understanding may be powerful, but are currently computationally infeasible across domains. Focusing on these complex cues may unnecessarily delay the automation of deception detection. All of the cues presented in this study are easily implementable using current commercial and open-source technology. As natural language processing continues to advance, however, more potential cues such as logical consistency, contextual embedding, and avoidance behaviors may become available for testing for possible use in improving automated deception detection.

A system designed for automated deception detection could be based on machine learning techniques that derive weights for the various cues presented in this study. (The automation of identifying possible cues to deception enables developing a fully automated deception detection system by taking advantage of machine learning algorithms.) Specifically, we could first use machine learning to discover the weights of cues from previously classified messages in a given context. Those cues or indicators could then be used to create a set of profiles for deceptive messages in that context. Finally, the values of indicators in a message could be fed as features into a system that learns to combine evidence to generate high-confidence warnings of deception. This machine learning approach to deception detection has the ability to adjust to different strategies of deception that appear in different contexts. The persuasive nature of the Desert Survival task used in this study may have resulted in the deceivers creating more words in their messages than truth-tellers. In other contexts, such as the criminal interrogations studied in much of the previous research, a deceiver may be trying to conceal facts and produce fewer words in a message than a truth-teller. Any generalizable automated deception method or system would need to adapt to different contexts. (Thus, adaptability will be a desirable feature of automated systems that can successfully detect deception in different contexts.)

5.3. Limitations

At least four plausible explanations exist to explain why our findings failed to support some of the LBC that had emerged in face-to-face settings. The communication goal of deceptive senders was to persuade the receivers to accept an incorrect solution to the problem. When deceivers feel the need of diverting others' attention from the right path in order to fulfill their goals, they are more likely to adopt a persuasive strategy. In order to influence their partners' decision, deceivers tend to invent substantial "evidence" to justify their misleading suggestions. Even though the deceivers generally go through cognitive difficulties and have little memory to recollect during the deceiving process, they are put into an advantaged position in the text-based asynchronous setting. These advantages include the invisibility of typical signs of cognitive difficulty such as delayed speech and hesitation between speeches and an abundance of time to fabricate messages. Without knowing who their partners are in TA-CMC, deceivers may begin building trust with their partners by intentionally demonstrating their "credibility" in performing the task. We can infer from the research results on virtual communication (Chidambaram 1996; Jarvenpaa and Leidner 1998) that physically distributed deceivers may have the motivation to build trust and a pseudo-relationship with their remote partners regardless of their diverse communication goals. Building a relationship of trust may be another practical deceiving strategy used to make up for the lack of memory, leading to longer messages. The observation of experimental messages confirmed our supposition. For example, Message 1 is from a truthful sender, and Message 2 and 3 are excerpts from two deceivers' messages.

Message 1: "*Water first, then coat to keep the sun and cold off, map and compass to navigate, canvas as umbrella and blanket, matches for night, transparent plastic for sand storms, book of plants?, knife, flashlight, mirror and gun I am uncertain what to do with.*"

Message 2: "*I wanted to let you know that when I was in High School I spent three days on a ""survival mission"" living in the snow covered woods with only limited supplies. Upon completion my YMCA team spent the next few weeks learning about survival in various other environments. I just thought that would offer some credibility on how I ranked my items. I took into account the time we would be there and the fact that situations like this are always filled with group conflict. I have a lot of recources on this and have refered to them. . .*"

Message 3*: "well, because i have actually taken a class about desert survival, i know what i'm talking about. The most important thing to have is water. . .*"

Deceivers' use of more group references also conforms to the goal of winning the trust of their partners. One may argue that the deceivers' longer messages were because of their less obvious ranking choices compared with the truth-tellers' more straightforward decisions. We do not think this factor is of concern for the following reasons: (1) few of the subjects have had real experience of surviving in the desert, so the correct answers are not self-evident; (2) even if several items are obviously more important than others, it is not easy for a dyad to achieve agreement on the ranking of 10 or more items; (3) when truth-tellers sense the irrationality in their partner's suggestions, they may jump into the defending position and produce long messages as well. Therefore, we believe that the difference in

message length between deceives and truth-tellers was a result of using an asynchronous and text-based form of communication as well as the nature of the experimental task.

A second explanation for why some sensory details were absent is also related to the nature of the task. Even though the task was set in a certain time and location, participants were mainly involved in discussing better ways of solving the immediate problem assigned to them. The genre of messages was more of argumentation rather than narration. Therefore, the discriminatory capability of spatio-temporal information and the specificity construct was not evident in this study. Clearly, further research is required before fully discounting the utility of these constructs in TA-CMC.

A third potential explanation might be the differences between TA-CMC and interviews or interrogations. In a structured interview, the interviewer has control over the subject and length of the interview. Given the reduced interaction resulting from asynchronicity and distance in the TA-CMC environment of this study, deceivers tended to produce more, rather than less language, and their language was richer in emotiveness and affective information. Since text was the sole channel deceivers could use to convey information and it had adequate capacity, they may have converted cues that would have otherwise been conveyed in other channels, such as body, facial, and/or voice, into text by providing more and richer language. Therefore, the pattern of quantity and expressiveness of language and affective information in deceptive messages in TA-CMC was a complete reversal of those shown in other real-time and face-to-face communication. This reversal also fits in with the view that deceivers are highly strategic (Buller and Burgoon 1994). When circumstances argue for trying to evade detection by saying less, which is what having to produce deception extemporaneously ought to encourage, they do so. Nonetheless, when there is time to create a more plausible and detailed fabrication, deceivers also do so. In addition, due to the loose structure and informal style of messages in TA-CMC, punctuations are not used with caution. Some subjects did not give a full stop to their sentences until reaching the end of their messages, while others simply used phrases rather than complete sentences in their messages. As a result, the effect of redundancy may have been nullified if there was any, and that of pausality was opposite to the prediction. The differences in punctuation and grammaticality in text-based communication raises a special challenge that researchers in TA-CMC will have to address.

Embedding decision-making within the task may serve as the last explanation for why our findings differ from past research. While making decisions on an unfamiliar task, both truth-tellers and deceivers are likely to display objectification, uncertainty, and generalizing terms. Therefore, these nonimmediacy markers are likely to be evident in the messages of all participants, regardless of their truthfulness, which would have dampened the effects of these LBC.

As mentioned, most of the LBC did receive support in the investigation. However, this study suggested that (1) notwithstanding their apparent utility with untrue reports in other contexts, some linguistic criteria from CBCA, RM, SCAN, and VI may not be valid in identifying intentionally falsified opinions in TA-CMC; and (2) some new LBC that were found to be effective for TA-CMC may not be extensible to other contexts.

Questions remain as to the external validity of these results to other tasks or contexts. We selected a decision-making task in this experiment. It is likely that deceivers may adopt

different types of strategy when they are given a different task, which may further lead to changes in linguistic behavior.

Language was not sufficiently natural. Due to the nature of the task, some subjects used an ordered list of items as the main corpus of their messages. As a result, the names of different items frequently appeared in the messages, which reduced lexical diversity and sentence length. Since these problems occurred in both deception and truth conditions, we can assume that the effect of listing in lieu of writing out narrative detail was equally applicable across conditions.

The reciprocal effect of receivers' behavior on sender communication was not considered here. In the experiment, some "intelligent" receivers, who had rich background knowledge, might have demonstrated less susceptibility to suggestions from deceiving senders. Being "caught" in the deception might have altered the sender's language.

We provided incentives for student subjects to participate in the experiment, but we did not offer special incentives for deceptive senders to succeed in deception. The questionnaire for deceivers conducted after each round of message exchange included some self-reported measures of deception, which helped monitor deceivers' behavior and intention to some degree. However, it might be better to give explicit motivation for accomplishing the task of deception.

7. Future research

Cross-validation studies are crucial with this type of applied research. We plan to test the effective cues found in this study with messages created for other types of tasks in real environments. Measurement of cues to deception can also be conducted beyond the word level, such as phrases, sentences, and messages. Thus, we may compare the effectiveness of LBC at different levels. We plan to further test the effectiveness of LBC in distinguishing truth from deception by examining messages composed by real-life deceivers.

The impact of deception strategy or speech act type on LBC, and longitudinal analyses of how LBC change as communication goals change, are also issues that merit exploration. How deceivers manipulate their linguistic behaviors over time is still largely absent in literature. Linguistic behavior is necessarily fluid, and it is likely that LBC will change as deceivers' communication goals change and they switch deception strategies.

Even though NLP techniques for semantic and pragmatic analyses are not yet mature, it is still possible to perform some kind of discourse analysis. It may enhance the effectiveness of deception detection by combining automated discourse-based cues, knowledge bases, and MoSyLs cues. Meantime, we can continue to enrich the list of LBC.

Deception research in face-to-face settings has received strong support from theories such as information management in IDT (Burgoon et al. 1996). In view of the contrary findings in this study, we believe that it is necessary to develop new constructs and theories to reveal the relationship between the underlying process deceivers go through and their exhibited behavior in the new medium of TA-CMC.

7. Concluding remarks

The results of this first investigation into LBC that are amenable to automation have validated some cues while challenging others derived from existing criteria and constructs such as CBCA, RM, SCAN, IDT and VI and are uneven in their congruence with results from face-to-face interactions. Based on this study and prior research, we conclude that many deception cues are highly context- and task-dependent, and that discerning profiles of reliable cues will necessitate clear delineation of the conditions under which deception is taking place. Nevertheless, the results indicate that nearly all the linguistic features we considered – quantity, informality, expressivity, affect, uncertainty, nonimmediacy, diversity, specificity, and complexity – are potentially relevant discriminators. CBCA, RM, and SCAN criteria have been tested in laboratory and field studies. Extending the above criteria to the context of TA-CMC, and revising them based on these empirical data, is appealing. After all, TA-CMC is a popular communication format and has distinguishable features from other communication types, thus the importance of developing a set of criteria adapted to TA-CMC.

In our opinion, the idea of detecting deception with automated LBC is feasible. Nonetheless, the same cue profiles are unlikely to apply uniformly across contexts. Future research must not only continue to validate what LBC are applicable to CMC but also what features of communication contexts and tasks will modify the patterns that are manifested. We hope the current investigation stimulates further inquiries along these lines.

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Identifying the source of critical details in confessions[1]

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ABSTRACT Interrogations leading to confessions can elicit both an admission of guilt and details to help validate the confession. Using a novel means of analysis, the interrogation was treated as a series of dynamic informational exchanges and the source of key details was identified. Questions and answers were classified according to the degree to which they provided information. Using a test case, in 212 of 340 questions the interrogators provided details to confirm or deny. In other questions, critical details were provided by the police without requesting confirmation. This pattern was reflected when the confession was divided into individual topics. None of the key, specific, verifiable details were provided by the confessor. This method of analysis is presented as a means of assessing the degree to which a confessor demonstrates guilty knowledge.

KEYWORDS confessions, interrogation, guilty knowledge

BACKGROUND

Confessions have often been cited as the most powerful evidence in producing a guilty verdict (Wrightsman and Kassin 1993). The psychological techniques involved in modern police interrogations have come under scrutiny as to the degree they are coercive and may elicit false confessions (Underwager and Wakefield 1992; Leo 1996). To try to distinguish between true and false confessions, the records, whether they be recordings, transcriptions or notes become the focal points of forensic linguistic analysis (Shuy 1998).

Forensic linguistic analyses of confessions have often focused on the qualitative aspects that define legitimate and false confessions (Leo and Ofshe 1998, Porter and Yuille 1996), the psychological determinants (Kassin 1997, 1998), and their deconstruction by topic (Shuy 1998). The last of these methods includes analysing question type, consistency and specificity of details, and, when inconsistencies are found, the progression of changes in the details.

In the analysis presented here, the confession is treated as both an admission of culpability and the provision of information that can confirm that culpability. By providing details that are specific, relevant, verifiable, and known only to the perpetrator, the confessor can validate the confession. The approach presented in this paper is to view the interrogation

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as a series of exchanges of information. These exchanges are treated as a type of negotiation with informational details being offered or provided, accepted or declined. It is proposed that by identifying the origin of these details and the degree in which they are provided, the presence of guilty knowledge can be established or confirmed. Alternatively, if the suspect is not the source of relevant details, it cannot be claimed that the suspect evinced guilty knowledge.

The statements of Jessie Misskelley, Jr., currently serving time for murder, comprise a confession in dispute. It has been presented in the literature as an example of a false confession (Leo and Ofshe 1998) while others have challenged this conclusion (Cassell 1999). The Arkansas State Supreme Court upheld Misskelley's conviction stating that 'The statements [obtained in the confession] were the strongest evidence against the appellant at trial. In fact, they were virtually the only evidence, all other testimony and exhibits serving primarily as corroboration' (Misskelley v. State 1996). Aspects of his confession were cited as evidence of inside knowledge as to the events that occurred. The disputed nature of the validity of this confession, the central role of the confessions in determining guilt, and the availability of transcripts and police notes make this an ideal case for this analysis.

METHODS

THE INTERROGATION AND TRANSCRIPTS

The interrogations of Misskelley leading to his arrest took place on 3 June 1993. Two of these interrogations were audio-taped and transcribed (Appendices 1 and 2). The first took place from 2.44 p.m. to 3.18 p.m. After this initial confession was rejected by a magistrate as grounds for a search warrant, a second, shorter interrogation took place beginning at approximately 5.00 p.m. (time and length not noted). These were preceded by interviews with the police of indeterminate length for which there are police notes. Until shortly before the taped confession, the suspect denied firsthand knowledge or culpability. This paper deals primarily with the two interrogations with transcripts and with the police notes relevant to the crime.

Quantitative analyses

Total word counts and words per exchange were determined from the official transcripts. Non-standard word combinations (such as 'kinda') were divided into two words. Uh-huh and variants (meaning yes) and huh-uh and variants (meaning no) were counted as single words.

Analyses of exchanges

For the purposes of this analysis, the basic unit of an interrogation was

defined as the exchange. In 328 out of 337 instances in these confessions, the exchange involved a question by the interrogator and a response by the suspect. The question was not essential. In some instances, the interrogator made a non-interrogative comment and still received a response. A response that addressed the question is referred to as an answer. Other responses were unrelated to the question, consisting of interjections, or else were interrupted.

The defining delimiter of the exchange was the response of the suspect. This definition was chosen because the entire purpose of an interrogation is to have the suspect talk. In analysing these interrogations, the exchanges were numbered incrementally according to the serial responses of the suspect (Appendices 1 and 2, exchanges A1–260 and B1–77). If the authority made several questions without any response, these questions were kept together and identified as part of the same exchange. It was only when the suspect made an intervening response that a particular exchange was considered complete.

Details

The defined unit of content of the exchanges was the detail. A detail was deemed any potentially relevant piece of information, including a thing, an action, and relevant qualifiers and quantifiers. Opinions were details. The statement, 'I don't know', was considered a detail (as it could be the factually correct one).

In order to determine who said what and with what degree of prompting, details, questions and answers were divided into categories. Three classes of details are the main focus of this analysis: the groupings of 'original versus repeat;' 'offered versus provided;' and 'consistent versus contradictory.' These classifications could be determined within the context of the statement with minimal reliance on comparisons to the disputed facts of the case. Details were also compared to undisputed facts and physical evidence as a measure of external validity.

Although not the main focus of this study, comments are made regarding subjective classifications of details including 'relevant versus irrelevant', 'specific versus non-specific', 'verifiable versus unverifiable', 'undisputed versus probable versus improbable versus impossible', and 'should only be known by the perpetrator versus is reasonably known by others besides the perpetrator versus is generally known.' These classes were not exclusionary, a given detail could align itself with one of the options in several or all of these groupings.

The classification of a detail as either original or repeat depended on the order in which it appeared in the interrogation. For the purposes of these analyses, a detail was 'original' when it was first brought up, either by the authorities or else by the suspect. If the detail was brought up again, it was a 'repeat detail.'

Police notes are also considered as a source for defining the origin of details. In the case presented here, the police notes have little to offer by way of additional relevant information. In other cases, they may provide more information. However, because they are summaries and sometimes impressions, it may be difficult to use these to resolve the source of details with certainty.

The identification of who brought up an original detail was crucial to this analysis. A confession that is only an admission of culpability remains unvalidated beyond the word of the confessor. By evincing knowledge that is specific, relevant, verifiable and known only to the perpetrator, the confessor validates the confession. Furthermore, the content of a confession can direct the authorities towards uncovering confirmatory evidence. In order to establish guilty knowledge, the suspect must be the one to bring up the details of the crime. In other words, using the definitions given above, the suspect must provide the original details. Although the origin of details can be analyzed within the interrogatory transcript, available knowledge of the crime, and prior communications, interviews and interrogations also need to be taken into consideration.

As a general example, in a hypothetical case, the facts of the crime are that the victim, a female, was stabbed three times in the heart. In one scenario, the police may ask 'What did you do to her?' and the suspect responds, saying 'I stabbed her three times in the heart.' The suspect provided three relevant and specific details: how the injuries were inflicted (stabbing), how many times that took place (three), and where the stabbings took place (in the heart). However, the police provided the general detail that the victim was a female.

Open-ended questions are valuable for eliciting original details from the suspect without providing details from the interrogators. For example, in the Misskelley case, the police ask: 'What occurred while you were there?' When I was there, I saw Damian hit these one boy real bad.' (A29, spelling as in transcripts).

Back to the hypothetical case. If instead the police said, 'The victim was stabbed three times in her heart. Did you do it?' and the suspect answers 'Yes.' In this case, the police provided all of the details. The suspect has admitted culpability, but has not demonstrated any knowledge of the crime. This common-sense distinction is the crux of the analysis presented here. Note in the above example that the police *provided* the details without any request for confirmation as to their accuracy and that these details were correct according to the hypothetical scenario. An example from the case presented here is when the police state: 'When this is taking place, you saw somebody with a knife. Who had a knife?' (A54). The knife had not been previously mentioned as being present at the scene. (This exchange is discussed in detail later.)

Between the above extremes are the exchanges in which the authorities

offer the details as a possibility. In the above hypothetical example, the police could have asked, 'Was the victim stabbed three times in her heart?' In this case, the answer 'yes', is a correct identification of what happened and suggests a degree of guilty knowledge. However, the degree is in doubt, because a false confessor may look for clues on when to agree. And, in the above instance, the suspect did not provide any specific details, only demonstrated the ability to say 'yes' to a correct offering. In the Misskelley case, the detail that the children were tied up is first offered by the police (A46). It is then repeated by the suspect (in agreement and then incorporated in A52).

Alternatively, the authorities can offer false options to see if the suspect is merely agreeing. The problem with this is that the other options must be equally plausible and be delivered without any verbal or non-verbal cues that they are incorrect choices.

DIVIDING QUESTIONS INTO CATEGORIES

Questions were divided into categories according to how they solicited details. These categories were 'open-ended', 'requests details', 'yes/no, offers details', 'multiple choice', and 'no question.' These were subdivided according to whether the solicited details were original or repeat (for confirmation). This expanded the categories of questions as follows: requests original details, requests repeat details, etc.

A question was defined as 'open-ended' when the requested response was a narrative and could be of indeterminate length. A question was classified as 'requests details' when the solicited information could be provided with a single detail or short list. 'No question' is when a comment or an incomplete question elicited a response.

Questions classified as yes/no or multiple choice, by their nature, offer information for confirmation. The 'yes/no-offers details' form of question had the authorities presenting details to confirm or deny. The 'multiple choice' form had the authorities offering two or more details to choose among.

In the compound yes/no questions, the authorities presented two or more yes/no questions without providing time for a response. The ambiguous nature of such questions elicits an ambiguous response. For example, when Misskelley was asked, 'Was there one knife, two knives, was your knife there?' (A113) he answered, 'Ugh ugh' (police transcription). Even if one concludes that Misskelley's response was 'no', it is unclear as to whether he responded to each part or to the last part (he had stated previously that it was one knife).

CATEGORIES OF RESPONSES

Answers were also grouped into categories. The category 'provides original details' was used where the response of the suspect is the first to

provide details. This may be solicited by an open-ended question, a request for details, or may be appended at any time to the response to any form of question or comment by the interrogators.

The category 'provides repeat details' was used where the suspect repeated details that had already been brought up by either party. These responses were used to determine the consistency of a story but not to identify the source of details. If a suspect changed a response to a conflicting form, the novel response was classified as original.

The categories 'yes, accepts offered detail' and 'no, declines offered detail' were used in direct correspondence to the question type 'yes/no, offers detail'. Answers were classified as 'yes' if either the terms 'yes' or 'I agree with that statement' could be substituted for whatever answer that was provided without changing the meaning. An interesting case was the question implied by: 'He doesn't know that' (A250). The answer of 'no' was a common way of Misskelley declaring that he agreed with the assessment. In this case, 'no' meant 'yes'.

Similarly, the categories 'yes, repeat' (i.e., yes, accepts repeat detail) and 'no, repeat' were in direct response to question type 'yes/no, repeat'. In the case presented here, Misskelley did not choose ambiguous terms for his answers; there were no 'maybes'.

The category 'selects offered choice' directly corresponds to the question type 'multiple choice' with the suspect specifically choosing one or more of the offered choices. In these confessions, the suspect never declined all of the choices offered in the multiple choice questions nor substituted one of his own. Finally, the category of 'no answer' was ascribed to responses that were interrupted or too incomplete to classify.

While the categories of answers had parallels in the nature of the questions, question-type did not necessarily correspond to answer-type within an exchange. A yes/no question sometimes elicited an answer with many details beyond simple affirmation.

THE CRIME

It is beyond the scope of this paper to discuss the many details of the crime. A brief overview is provided here and later specific aspects that relate to statements in the confession will be presented. In summary, three eight-year-old boys, Steve Branch, James Michael Moore, and Christopher Byers disappeared on 5 May 1993 in West Memphis, Arkansas. Their bodies were found the next day, naked, bound, brutalized, and sunken in the mud of a shallow creek in a small patch of woods. One month later, 17-year-old Misskelley confessed to his role in this crime, that of preventing the escape of one child. Misskelley also implicated 16-year-old Jason Baldwin and 18-year-old Damien Echols as the murderers. All three defendants pled innocent. The confession of Misskelley was called into question at his trial on the grounds that it was coerced, that the confession

had major inconsistencies and discrepancies, and because Misskelley had an IQ of 72 (one of the interrogators testified that the police were unaware of the Misskelley's mental deficiencies). Regardless of these assertions, Misskelley was convicted, receiving a sentence of life plus 40 years. In a separate trial (where Misskelley's confessions were not admitted) Baldwin received life without possibility of parole, and Echols, a sentence of death. These cases achieved notoriety first through widespread media publicity and later as the subject matter of two documentary films (Berlinger and Sinofsky 1996, 2001) which explored the quality of justice rendered in these cases.

RESULTS

Quantitative analyses of the interrogations

A total of 6739 words were spoken in 337 exchanges over the course of the two interrogations with the detectives providing 4207 words and the suspect providing 2532. This is 12.5 words per exchange for the interrogators and 7.5 for the suspect. For the first interrogation the median length of response was 4 words and the mode was a single word. It is important to note that brevity of response, in and of itself, has been shown to be a correlate of deception (Porter and Yuille 1996).

The classification of the questions is presented in Table 1 – note the same question may be assigned to more than one topic. In the 337 exchanges, 340 questions were asked, with several exchanges involving multiple questions before a response, and several having no question. Yes/no questions including original, repeat, compound and (one) unclassifiable, made up 212 or 62.4% of the questions. Only 12 questions were open-ended, although there were an additional 9 instances where comments or incomplete questions brought responses. In 183 exchanges, 54.3%, the police provided original details.

The suspect responded with answers in 330 exchanges. In 143 of these (43.3%), he accepted the details offered by the detectives. In 39 exchanges (11.8%), he declined the offered details. In 109 exchanges (33%), he answered the questions by providing original details. In another 43 exchanges, he appended his answers with original details. In a number of exchanges the police both provided and requested details, these categories were not exclusive.

Misskelley never disputed the premise of a question. In the two instances where he was told that he had already said something, he agreed, even though his prior statements were substantially different from those offered for confirmation (A131, B04). In 23 of 25 questions where Misskelley was given multiple choices, he selected at least one. In the other two instances he was interrupted before he could complete a definable statement. When Misskelley was presented with details as facts, he never disputed these details.

There were seven instances when the police presented yes/no questions with no being the most probable answer (offering false details). In each of these instances Misskelley affirmed the improbable (e.g. A80).

Topic analyses/origin of details
The absolute and relative numbers of words and details alone are insufficient to determine guilty knowledge. Each detail must be assessed by its relevance, specificity, accuracy and origin. The exchanges were grouped into 11 topics (Table 1). These groupings were not exclusive, one question or response could address several topics. We will concentrate on four of these topics which contain the vast majority of the exchanges: the location of the crime, the time of the crime, exchanges related to aspects of violence, and exchanges related to rape and restraint. The classification of the questions and the responses is presented in Tables 1 and 2, respectively.

The location of the crime
For the purpose of this analysis, the crime scene is considered to be the woods where the bodies were found and where Misskelley alleges the attacks took place. The prosecutor presented this area as the murder scene. Misskelley made no mention of any other crime scene. This portion of the analysis only refers to the geographic details of this area.

The bodies were found submerged in a shallow, stagnant creek. The woods surrounding the creek are sometimes referred to as the Robin Hood Woods. These woods are bordered on the west by the Blue Beacon Truck Wash, on the north by Interstate 40 and a parallel service road, on the east by a large meadow, and on the south by a broad bayou diversion channel. There are apartments and houses on the other side of the bayou. A pipe crosses the bayou connecting the wooded area to a residential area. The victims' bicycles were found in the bayou.

The major path that leads from the site where the victims were found goes to the southern end of the Blue Beacon Truck Wash. A minor path leads out to the southern part of the meadow. There is an eleven foot bank overlooking the site where one of the victims was found, presumably the tall bank referred to in the statements.

Commentary
The only details that Misskelley presented regarding the inside of the woods were that the path (brought up by the interrogators, A40) is little (A40), and the tall bank (brought up by the interrogators, A72) has a top (A72) and bottom (A73). Misskelley did provide exterior geographic details, Robin Hood (A25) is by the Blue Beacon Truck Wash (A26), the service road (A36), and the interstate (A41). Given three options, Misskelley chose that the crime beating began in the woods, rather than in the field or at the side of the big bayou (A38). Misskelley changed his

Table 1 Nature of Questions

Topics covered	Total Exchanges	Total Question	Yes/no Original	Yes/no Repeat	Compound Yes/no	Multiple Choice	Request Details	Repeat Details	Open Ended	No Question
All topics	337	340	133	69	9	2	75	14	12	9
Time of the crime	35	33	12	5	1	3	8	3	1	2
Place of the crime	44	43	18	5	0	4	13	2	1	1
Related to violence	97	101	38	20	3	12	24	1	2	1
Related to rape/restrain	57	62	22	18	1	5	9	3	2	2

Some exchanges have more than one question, some have no questions. Exchanges, questions and responses may refer to and be categorized in more than one topic.
Topics not included in these tables are clothing, police procedural/interrogation related, activity prior to the crime/getting there, activity after the crime, cult activities and several miscellaneous.

Table 2 Nature of Response

Topics covered	Exchanges	Total Answers	Yes, accept detail	Yes, repeat	Decline detail	No, no repeat	Offered choice	Selects original details	Provide repeat details	No answer Interrupt
All topics	337	330	95	48	34	5	23	109	16	7
Time of the crime	35	33	9	7	1	0	3	11	2	2
Place of the crime	44	44	11	2	4	1	4	15	2	3
Related to violence	97	97	25	17	13	2	12	26	2	2
Related to rape/restrain	57	57	15	9	9	3	4	14	6	1

Exchanges are defined by the presence of a response, therefore response count equals exchange count. Answer count differs from response count inasmuch as sometimes two questions are addressed in some responses and no answer is given in others. Answer type does not have to match question type.
Other topics not covered in this table are listed in the legend of Table 1.

statement regarding whether or not he could see the kids on the bikes as they arrived and as to whether or not the victims were in the water (A84–5, A173 and A165, B34, respectively). He was incorrect in stating that the path that leads out from the crime scene goes near the interstate (A41–2).

While Misskelley gave no specific details of the interior of the woods, the police provided a nearly complete description of the crime scene, interior and exterior including the creek (A36), its size (A70), the direction it runs (A70), the existence of a path (A40), descriptions of the creek banks (A72) and their orientation (A70), along with area landmarks including the pipe (A45), the houses (A44), the field (A38), and the bayou (A38). Most of these details were provided without asking for confirmation. When yes/no questions were asked, no false details were used for testing.

There was only one open-ended question asked by the police during these 44 exchanges (A39) and Misskelley's response was 'uh'. Misskelley was asked five times whether he would be willing to go with the police for a videotaping (A185–7). The first two times, he gave no answer. The third time when asked if he wouldn't have any problem with 'that' (going along with the videotaping), he answered, 'Not that I know of.' In the fourth instance he was asked if he would be able to point out where these things took place and this time he said 'yes'. The fifth instance, he was given specific examples of what he would need to point out and he responded by saying that he had been there once afterwards and hadn't been there since. No videotaping took place.

Misskelley said there were no witnesses that saw him there (A238) and his statement that one person went back there with him afterwards was quickly retracted (A183–4). The only police notes referring to the location of the crime was an early denial by Misskelley that he had ever been to Robin Hood Woods. Together with his inability to bring up any specific details of the crime scene, this indicates that Misskelley demonstrated no substantive knowledge of the interior of the woods where the bodies were found.

The time of the crime

For the purpose of this analysis, statements referring to the time of the crime were those that addressed the time period from getting to the crime scene through the time of the murders. The three victims were last seen at approximately 6 p.m. on Wednesday 5 May 1993. Their bodies were found the next day after 1 p.m.. The state medical examiner placed their times of death as between 1 a.m. and 5 a.m. on the sixth. The prosecution presented the times of the murders as being 7 p.m. to 8 p.m. on the fifth. The lack of light in the dense woods, the lack of the ability to account for the additional time in which the children were missing, and the alibis that the defendants had for later in the evening may have accounted for the rationale of the proposed time of the murders.

Commentary
This is a subject for which Misskelley provided many details. Some of the minor discrepancies may be caused by the fact that sometimes Misskelley referred to the time when he, Echols, and Baldwin left for the crime scene, when they got to the crime scene, when the victims arrived, when the murders took place, and when Misskelley got home. Other exchanges may refer to events separate from the crime without a clear demarcation of change in subject (A146–51). However, this cannot begin to explain the wide discrepancies in the times. Misskelley either said or agreed that they (Misskelley, Echols and Baldwin) went to the crime scene at 9 a.m. (A22), got there about 9 a.m. (A101–2), or early in the morning (A100), or else at 6 (B07) or about 6 p.m. (B08) or they were there about noon (A79-80). The victims arrived at 5 or 6 p.m. (B01), at 7 or 8 p.m. (B04), at about 7 p.m. (B11), or else when it was getting dark (B05, sunset 7.49 p.m.). The murders took place in the morning (A108), just before dark (B12) or at night (A108, A144, A148, A163, A204). The time of death was a point of great contention at the trial with the defence proposing that Misskelley was coerced into saying a particular time (this matter is presented in Leo and Ofshe 1998).

The police offered Misskelley impossible times with which to agree (e.g., By nine, did Misskelley mean nine in the morning? (A101–2)). Misskelley agrees with all of the impossible times.

The police brought up that the murders took place at 7 p.m. to 8 p.m. over the course of exchanges #A108, A234, B02.

> Detective R: It was like earlier in the day, but you don't know exactly what time, okay cause I've gotten some real confusion with the times that you're telling me, but now, this 9 o'clock in the evening call that you got, explain that to me.
> Misskelley: Well after, all of this stuff happened that night, that they done it, I went home about noon, then they called me at 9 o'clock that night, they called me.

126 exchanges later:

> Detective R: Okay, they killed the boys, you decided to go, you went home, how long after you got home before you received the phone call? 30 minutes or an hour?
> Misskelley: Uh, (silent) an hour (Note: the transcriber included the term 'silent. ')

Approximately two hours later in the second interrogation, regarding the time the victims arrived:

Detective G: Uh, alright you told me earlier around 7 or 8, which time is it?
Misskelley: It was 7 or 8

There is no record that Misskelley said he was called at 9 p.m. that night although in the police notes it is stated 'After Dark Jason on line Damin in Back Ground' and 'Jessie was not sure of times of phone calls.' Misskelley was only given two choices with the assumption that one was true, that he got home either 30 minutes or an hour before the call. Exchange #A108 (above) was the original instance that night was brought up as a potential time for the murder, although, due to the reversal of order in the events, this may have been due to a misplaced clause.

Statements regarding acts of violence

For the purpose of this analysis, statements related to acts of violence were those referring to: the nature and location of the injuries; who received and who caused particular injuries; weapons and instruments used to cause those injuries; and where the victims and perpetrators were when those injuries occurred. Injuries that may have been secondary to rape and restraint are included in the following topic.

The following descriptions of injuries is derived from autopsy reports, ME 329-, 330-, and 331-93. The three victims received multiple injuries over their bodies, including contusions, abrasions, cuts, lacerations, scratches and gouging. Two injuries were of particular note: Byers had his testicles removed and his penis skinned and the area gouged; and Branch had most of the left side of his face gouged out. Deaths were determined to be due to multiple injuries for Byers and due to multiple injuries with drowning for Branch and Moore. The police presented an autopsy photo of Moore to Misskelley prior to the recorded interrogations.

The weapons used were a matter of contention. No weapon was presented at trial that was directly linked to the murders. Potential weapons that were linked to the defendants had no trace evidence that linked them to the crime. Potential weapons linked to the murder scene had no trace evidence that linked them to either the crime or to the defendants. Wounds were consistent with being struck with a blunt object, being struck or else making contact with patterned objects, being cut and poked with sharp objects, being scraped or in contact with scraping surfaces, and drowning. Possible weapons that appeared in these confessions were: knives, sticks, a gun, a belt, hands, and water.

The location where the injuries and murders took place was also a matter of contention. There was no visible blood in the area other than specifically where the bodies were found and placed. All three boys were discovered submerged in a shallow creek with Moore's body found 27 feet north of the other two.

Commentary

The exchanges related to violence mirror the types of exchanges in other topics. In 97 exchanges, 101 questions were asked, 61 of these providing details for confirmation. Twelve were multiple choice including the identification of which victim received which particular injury. This took place by having Misskelley choose among pictures of the three children. Two questions were open ended and one exchange did not have a question from the police. This 'no question' exchange elicited one of the most significant responses, the one in which Misskelley recounts his only direct participation in the crime, the chasing down of Moore (A38).

Of the possible weapons, Misskelley is the first one to bring up the use of hands (as fists, A34), and of a gun (A149). No gun was ever produced nor is there any evidence of its existence beyond these accounts. There were no bullet injuries nor was it contended to be the source of injuries. In the police notes of the earlier interviews, Misskelley refers to two guns.

The police brought up knives, sticks, water and belts. The presence of a knife is brought up without asking for confirmation (A54). According to the police notes, Misskelley said that Baldwin (but not Echols) owned and always carried a knife, but there is no note as to whether the knife was present during the crime or used in the crime. It is possible that the police inferred the knife's presence from the statement 'always carries'.

When the police asked Misskelley whether sticks were used in the attack, he agreed (A133), characterizing it as 'a big old stick' (A133). No splinters or trace evidence were found to confirm the victims were struck by sticks. The police bring up water both in regards to where the crimes took place (A163, others) and as to whether Misskelley saw the children in the water (A165, B33–5). When asked whether the children were in the water, Misskelley said 'no' (A165) and on other occasions he says they were close to or by the creek (A67–8, B33). When asked, 'Alright, how did the boys get into the water? ' Misskelley followed this premise by saying 'They pulled them there into the water.' (B34)

Who owned belts was brought up by the police (B36–8). While a belt was offered at trial as being a source for some of the injuries, Misskelley was never asked whether it was used during the crime.

As regards the nature of the injuries, in two instances Misskelley identified both who received specific injuries and where those injuries were. In one instance Misskelley identified only who received an injury but not the location. And, in one other instance, Misskelley identified the location of a specific injury without identifying who received it.

When asked to identify who was initially hit by Echols, Misskelley points to a picture provided by the police and identifies this picture as Moore (A30). The detective responded that Misskelley was pointing to Byers, to which Misskelley agreed (A31–3). The detective then matched the names to each of the boys pictures. The detective offers where Byers

was hit (in the head) to which Misskelley agreed (A33), with Misskelley adding Echols used his fist (A34). All three victims had contusions consistent with being hit in the head.

When asked to identify where a child was cut, Misskelley said 'at the bottom' (A57). Over a series of four questions, the police ask if the victim was face down at the time, then point to the area, then ask whether if by bottom Misskelley meant groin, and then ask if Misskelley knows what the child's penis is (A58–61). Only then did Misskelley say the penis was where he was 'cut at ' (A61) and again points to the picture of Byers (A62–3). When offered a third opportunity to confirm, Misskelley hedged this statement by saying: 'That's where I seen them going down at, and he was on his back. I seen them going down real close to his penis and stuff and I saw some blood and that's when I took off (A66).' The police bring up the child's penis being 'cut off' in a later exchange (A124). Another interpretation is that the police were merely directing the precision of Misskelley's language and not changing what he said.

Misskelley said he witnessed one child being killed (A192). He said this child was choked to death (A195), the perpetrator using 'His hands, like a stick, he had a big old stick, kind of holding it over his neck (A196).' The detective then offered and Misskelley agreed that he was choked to the point of being unconscious and that it looked to Misskelley like he was dead (A197). As in each instance in which Misskelley identified a child by picture, he points to Byers (A193–4). No child was killed by strangulation nor was there evidence that any child was strangled. When asked later, if he (Misskelley) was there when they were 'actually killed', Misskelley responded, 'I don't know' (A198).

In contrast, according to the police notes of the earlier interviews, Misskelley identified Moore as being killed by Echols and that 'Damien and Jason killed but he [Misskelley] did not'.

Misskelley was the first to bring up that one boy was cut in the face (A56), although he was not asked to identify who, nor to qualify how bad the wound was. In a later exchange he agrees with the police statement 'Okay, one of them were cut on the face real bad, is that what you said?' (A131). This injury was characterized as Misskelley having knowledge of the massive wound that Branch had on the left side of his face (ME 330–93). All three victims had facial lacerations including Moore, whose autopsy photo was shown to Misskelley.

During the interrogations Misskelley said he saw one child killed (discussed above), then agreed with the police that this child may have only been unconscious. Misskelley said he doesn't know if he saw the other two boys killed (A198). In subsequent exchanges the police provided as the premise of their questions Echols and Baldwin killing the children or Misskelley witnessing such without asking Misskelley to either confirm or deny (A234, A253).

As mentioned in the analysis of the geography, Misskelley provided no evidence that he was familiar with any landmarks within the woods where the bodies were found. A slightly different question is whether Misskelley correctly identified where specific violent acts took place in the woods. When the police asked if all of them were near the creek when the cutting (of Byers) occurred, Misskelley agrees (A67–8). When asked which side of the creek they were on at the time, Misskelley said the Memphis side (A74). These two descriptions are consistent with the location the prosecution presented as the murder site, although not consistent with where Byers body was found. The first question only involved agreeing with police statement, the latter was a choice among two.

Misskelley's statement that Moore ran off has been cited as consistent with the fact that this child's body was found 27 feet away from the other two. Misskelley's statements do not support this. Without prompting, Misskelley stated Moore ran off and that he, Misskelley, held him until the others got there (A35). Misskelley later says the boy ran out of the park, with Misskelley bringing him back (A43). When given three choices as to where he ran, Misskelley chose the opposite direction from which the body was found (the houses, A44–5). In a third version, Misskelley identified the Service Road as the place he was when he brought the kids back together (A36). Misskelley's contradictory statements support Moore being separate and south of the other two, or together in the same place, but not in the direction where his body was found.

Rape and restraint

For the purpose of this analysis, exchanges dealing with rape or restraint were those referring to the occurrence of sexual acts performed on the victims, the nature of these acts, identification of the perpetrators and victims, and injuries secondary to these acts. Those dealing with restraint include any reference to manners in which the victims were made compliant, were prevented from escaping, calling for help, or fighting back.

The matter of whether and how the victims were raped was a matter of contention. The physical evidence was ambiguous with many circumstantial indicators suggestive of a sexual nature to the crime, but without the expected evidence confirmatory of rape.

The victims were found naked. All three victims had dilated and hyperemic anuses, although this can occur with death. No rectal injury, tearing, bruising or hemorrhage was found. In contrast to the other two, Byers' anus was described as markedly dilated with the surrounding tissue 'diffusely hyperemic and injected' (ME 331–93). He alone had a significant amount of bruising about the thighs. No semen or sperm was found on any part of their bodies, although a stain on one of the children's pants had a centrifugation band 'consistent with a sperm fraction.' All three victims had spaced linear scratches on their ears suggestive of being held

there. For two of the victims these were accompanied by semilunar bruises. These injuries were proposed as having been secondary to forcing them to provide oral sex. No damage was found to the back of the mouth consistent with forced oral sex, although bruising secondary to oral sex with clenched teeth was proposed at trial. The genitals of Branch showed scraping marks consistent with teeth. The testicles of Byers were removed and not found. His penis was skinned. The fact that the victims were found in water was postulated as a means by which trace semen was lost.

Each victim was 'hog-tied' with the right wrist tied to the right ankle by one shoelace and the left wrist to the left ankle by another. The children's shoes were the source of at least five of the laces, with one lace left in one child's shoe. The source of the additional lace was not determined. It was postulated that a gag was used, although no fibres were found in the mouths of the victims. Holding the children by their ears (above) was also considered as a means of restraint.

Commentary

Misskelley made eight statements identifying who was raped and nine statements identifying who performed these acts. When asked if Echols and Baldwin had sex with the 'boy whose penis was cut off' (presumably Byers, above) Misskelley answered no (A124), then said Baldwin did (A125), then said they both did with Baldwin performing anal sex while Echols received oral sex (A126). Later, Misskelley said Echols raped Myers (sic, B48) by 'hisself', while both Echols and Baldwin raped Branch (B48), then confirmed this statement (B49). Later Misskelley said both Branch and Byers were forced to perform oral sex (B51) and that both Echols and Baldwin were the recipients (B50). Misskelley also said Echols performed anal sex while Baldwin received oral sex with an unidentified child at the same time (A123) and separately (B58).

On three matters Misskelley was consistent. Moore was not raped (B46, and six other responses where Misskelley specifically names the other two victims). None of the victims received oral sex (B59, B60, B62–3). Misskelley also denied his involvement in any of this (A190).

Twelve exchanges centred around the means by which the victims were forced to provide oral sex. Misskelley's first answer was that 'One of them had holding them by the arms while the other one got behind them and stuff' (B66). A series of exchanges then took place wherein the detective asks if they were held 'up here' (the gesture of the detective not defined, B67, B69). Misskelley answered they were held by a headlock and then followed with a gesture which was described by the transcriber as holding them by the ears (B68). Another three exchanges were made regarding this method of holding in which Misskelley describes his gesture as holding by the head (B68, B75), said he was too far away to tell (B69), and then, finally, by the ears (B76–7).

The forcefulness of the sex is addressed in several exchanges. The victims were referred to as fighting back before and after (B55–6), the legs of one were lifted in the air as he kicked and complained during the anal sex (A127). The ears were being pulled on for oral sex (B70, B76).

As for methods of restraint, Misskelley without prompting, brought up holding (A35). The police brought up tying (A46) with Misskelley later adding that it was their hands that were tied (A52). The police twice offered that something more than tying hands must have been necessary to keep the victims from running off (A128). In response, Misskelley brought up a variety of other means including beating them up 'so bad that they could hardly move' (A128), 'sitting on the children' (A128), 'holding a child's legs up in the air' (A129), and 'they knocked them down' (A129). In other instances, he said they were unconscious (A120), or they could run (in the same response where he explains why they couldn't (A130)), and that the children were fighting back all the time (B56). Misskelley never mentioned feet being tied or feet tied to hands. The exchanges that elicited the statement that holding by the ears was used as a method of restraint and compliance are discussed above.

When asked what the victims were tied with, Misskelley said brown (B32) rope (B31) rather than black and white shoelaces. As problematic as this was, so was his description that only the hands were tied for restraint. Since right wrist was tied to right ankle and left wrist to left ankle, if only the hands were tied one lace would be dangling from each wrist, a relatively useless means of restraint.

Four means were presented by Misskelley to explain how the boys were kept quiet during the attack: being unconscious (A120); hands held over their mouths (B52); Echols, (B57) shirt being used as a gag (B53); and the presence of a penis in their mouths (B54). In another statement, Misskelley points out that a child was able to speak (A127).

Misskelley's recounting of aspects of the crime related to rape and restraint were often specific and graphic but comparing responses to the evidence regarding rape in this case is problematic. The nature of the crime strongly suggests a demented and possibly sexual undertone. On the other hand, rectal tearing, bruising and injury would be expected in children this young. There is no evidence to suggest the brutal anal sex that Misskelley described occurred. Although Misskelley states that Moore was not raped, the evidence used to suggest Branch was raped was not qualitatively different from that of Moore. Furthermore, Misskelley's statements show repeated contradictions. And, finally, Misskelley is adamant in that the victims did not receive oral sex which is inconsistent with the scrapings on Branch's penis.

DISCUSSION

There are three spheres in which the validity of a confession may be

assessed: internally, externally to the evidence that is described in the statement, and, by whether there is other evidence to support the guiltiness of the confessor. The method put forth in this paper deals primarily with the internal analysis: looking at the origin and consistency of key details. It is proposed that by identifying the source and degree of provision of key details it will be possible to determine whether the suspect has displayed guilty knowledge. In turn, this guilty knowledge is powerful confirmation of actual guilt. Since this method deals with identifying the origin of details, it is also important to consider information sources available prior to the interrogation.

It is possible that prior communications by the suspect will define what are later seen as leading questions in a formal interrogation. In this sense, a confession may be viewed as the terminal communication of what may be hours of preparatory interviews. To avoid ambiguities in identifying the source of details in such circumstances, it is critical to have all relevant interviews recorded or at least to make thorough notes of these discussions.

This method of analysis is particularly suited to the case presented here: the confession and the evidence that Misskelley had knowledge of specific details of the crime were cited as reasons for upholding his conviction; and transcripts of the crucial confessions are available. The police notes of earlier interviews were of limited significance in this case, and it was within the context of the recorded interrogations that the police were the source of nearly all of the substantive information regarding the crime. However, it should be noted that the counting of details can be illusory: Misskelley provided details in 152 exchanges. It is only through the examination of the details related to each topic that the value of individual details can be assessed.

Misskelley's apparent lack of awareness of the geographical area of the crime scene is significant. While what took place and how is open to interpretation, the landmarks that surround where the bodies were found are fixed, specific, and incontrovertible. No evidence is provided in Misskelley's confession that he had any specific knowledge of the geographical details of the interior of the woods or even many details of the exterior. In regard to this topic, the police provided all the important details, most without asking for confirmation.

Misskelley offered that the events took place over any of a range of times from 9 a.m. to 8 p.m. or later, depending on how the term 'night' is interpreted. What Misskelley meant by night is never clarified. The police provided the closest times to those subsequently proposed by the prosecution.

Misskelley displayed no evidence that he knew when the crimes were committed.

Misskelley made no specific statements regarding the violent acts com-

mitted during the murders that were verifiable and were without details and/or direction provided by the interrogators.

Misskelley's statements dealing with matters of rape and restraint offer a variety of conflicting details. Taken out of context some of these can suggest guilty knowledge, but within the context of multiple and contradictory answers these statements are consistent with Misskelley fabricating a little bit of everything. The most significant detail, restraint by tying, is provided by the police, while the presence of bruise marks on the ears, is elicited by the police after multiple leading questions.

The reasons for the contradictory, evasive, brief, and non-informational answers are debatable. Although parallels are drawn here, a confession is not the same as a pedagogical examination. In a confession, the guilty party has strong motivations for hiding portions or all of the truth. In the case of this confession, Misskelley provided without prompting early into the interrogation his only alleged direct involvement in the crime: capturing and returning Moore when he tried to escape. The details regarding the involvement of the other participants changed repeatedly without apparent pattern or reason.

Similarly, the police may have legitimate reasons for providing a suspect with information via leading questions. This may be to clarify an obscure statement, to help the suspect overcome a limited vocabulary, or to direct a suspect to discuss matters that may not seem to be of significance to him. In this sense, the police walk a tightrope between eliciting a specific meaningful confession and not providing the crucial substance of the confession.

Regardless of the motives of the police or whether it was due to Misskelley's ignorance of the facts or his reluctance to articulate them, what was said on record does not support the contention that Misskelley demonstrated knowledge of the crime. Misskelley made a statement consistent with admitted culpability, but not consistent with guilty knowledge.

The profession of guilty knowledge is often used as evidence to prove the validity of confessions and therefore prove guilt. Presented here is a systematic means of analysing the information in confessional interrogations so as to determine what was said, by whom, and with what degree of prompting. While other forensic linguistic analyses have examined these issues, it is my hope that by classifying the means and degrees by which information is offered, accepted or provided, this can be used to show whether guilty knowledge has been demonstrated. As most confessions are not false ones, this method can confirm guilt by elucidating which relevant details were provided by the suspect.

NOTE

The author, Dr Martin Hill, has no affiliation or financial connection with any legal parties in the ongoing appeals of this case. Thanks to Dr. Roger Shuy for helpful critiques on an early draft of this article.

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APPENDIX 1

Police transcription of first audio-taped interrogation of Jessie Misskelley Jr. timed as taking place between 2.44 and 3.18 p.m., 3 June 1993. Exchanges are delimited at the point of the response with the letter 'A' indicating the first confession and numbering its place in the sequence. The detectives are designated by the initial of their surnames. Other aspects are left unchanged including misspellings and commentaries by the transcriber.

DETECTIVE R This is Det. Bryn Ridge of the West Memphis Police Department, currently in the detective division of the West Memphis Police Department conducting an investigation of the Triple Homicide, Case File # 93-05-0666. Currently in the office with Jessie Lloyd Misskelly, Jr., DOB7/10/75, education9th grade, the placeDetective Division, todays date is 06/03/93, the time is 244Pm. Present in the interview is Insp. Gary Gitchell and Jessie Misskelly. Jessie, in front of me I have a rights form, and it has your signature at the bottom of it, is that your signature?

A01 MISSKELLEY Yes sir

DET R Okay, we are informing you that we are Det. Sgt. Mike Allen, and Det. Bryn Ridge, and Det. Sgt. Mike Allen is the one that read this form to you earlier, is that correct?

A02 Yes sir

DET R And I was here when he read it to you.

A03 Yes sir

DET R Alright, we are police officers of the West Memphis Police Department, we are conducting an investigation for the offense Capitol Felony Murder, which was committed on or about 05/05/93, before we ask you any questions, you must know and understand your legal rights, therefore, we warn and advise you, that you have the right to remain silent, do you understand that?

A04 Yes

DET R And those are your initials on the line in front of that statement?

A05 Yes

DET R Okay, anything you say can be used against you in court, do you understand that,

A06 Yes, I do

DET R And those are your initials?

A07 Yes, it is

DET R Alright, you have the right to talk to a lawyer for advise before we ask you any questions, and to have him with you during questioning, do you understand that?

A08 Yes, I do

DET R And those are your initals?

A09 Yes, it is

DET R If you cannot afford a lawyer, one will be appointed For you before any questions, if you wish, at no cost to you, do you understand that?

A10 Yes, I do

DET R And those are your initials?

A11 Yes, it is

DET R If you decide to answer questions now without a lawyer present you will still have the right to stop answering at any time, do you understand?
A12 Yes, I do
DET R Those are your initials?
A13 Yes, it is
DET R You're up here on your own free will, you came up here to answer some questions, and basically we've found out some information during that questioning, is that correct?
A14 Yes sir, I did
DET R Okay, at the bottom of the form is a Waiver of Rights, it says that I've read this statement of my rights, and I understand what my rights are, I am willing to make a statement, and answer questions, I do not want a lawyer at this time, I understand and know what I am doing. No promises or threats have been made to me, and no pressure or force has been used against me, is all of that correct?
A15 Yes
DET R Okay, and you signed the bottom of the form?
A16 Yes, I did
DET R Witnessed by Michael Wayne Allen and myself, Det. Bryn Ridge. Okay, Jessie, let's go straight to that date, 05/05/93, Wednesday, early in the morning. You received a phone call is that correct?
A17 Yes, I did
DET R And who made that phone call?
A18 Jason Baldwin
DET R Alright, what occurred, what did he talk about?
A19 He called me and asked me if I could go to West Memphis with him and I told him, no, I had to work and stuff. He told me that he had to go to West Memphis so, him and Damian with and then I went with them.
DET R Alright, when?
A20 Wednesday
DET R Alright, when did you go with them?
A21 That morning
DET R 9 o'clock in the morning?
A22 Yes, I did. I went with them and then
DET G Now, where you in a car? Whose car where you all in?
A23 We walked
DET G You all walked?
A24 Right, we walked and then uh,
DET R Where did you go?
A25 We went up to Robin Hood
DET R You went to the Robin Hood, explain to me where those woods are.
A26 By uh, Blue Beacon Truck Wash.
DET R A little patch of woods
A27 A little patch of woods
DET R Behind Blue Beacon?
A28 Behind it, right there behind it.
DET R okay, what occurred while you were there?
A29 When I was there, I saw Damian hit these one boy real bad, and then uh,

and he started screwing them and stuff and then uh,

DET R Alright, you got in front of you a picture, that was taken out of the newspaper I believe, it's got three boys and these are the three boys that were killed on that date in Robin Hood Woods, okay, which one of those three boys is it you say Damian hit? The third picture, which will be

A30 Michael Moore

DET G This boy right here,

A31 Yeah,

DET G Alright, that's uh the Byers boy, that's who you are pointing at?

A32 Yes

DET R If you read the caption, the grizzly slain from left, 8 year old Michael Moore, Steven Branch and Christopher Byers. Okay, so you saw Damian strike Chris Byers in the head.

A33 Right

DET R What did he hit him with?

A34 He hit him with his fist and bruised him all up real bad, and then Jason turned around and hit Steve Branch

DET R Okay

A35 And started doing the same thing, then the other one took off, Michael Moore took off running, so I chased him and grabbed him and hold him, until they got there and then I left.

DET R Alright, when you get the boys back together, where were you at from the creek?

A36 I was up there by the Service Road

DET R Up by the Service Road?

A37 Yes

DET R Okay, now when this, when he hit the first boy, where are they at when he hits him, are you in the woods, you're on the side of big bayou, you're out in the field, where were you at?

A38 I was in the woods.

DET R In the woods. Okay, you've been down there in those woods before, can you describe to me what in those woods, what's the location where you were?

A39 Uh,

DET R Is there a path that you go down?

A40 Uh, down a little path

DET R Alright, where does that path go too?

A41 It leads out there close to the field, close to the interstate.

DET R Okay

A42 Close to the interstate

DET R When he hits the first boy and then Jason hits another boy, and one takes off running, where does he run too?

A43 That one, he runs out, out the park and I chased him and grabbed him and brought him back.

DET R Which way does he go, I mean, does he go back towards where the houses are, he's going to Blue Beacon, is he going out towards the fields, where's he running too?

A44 Towards the houses.

DET R Towards the houses?
DET G Where the pipe is that goes across the yards?
A45 Yes, he run out there and I caught him and brought him back, and I took off.
DET R Okay, and when you came back a little bit later, now are all three boys are tied?
A46 Yes
DET R Is that right?
A47 Yes, and I took off and run home.
DET R Alright, have they got their clothes on when you saw them tied?
A48 No, they had them off.
DET R They had already gotten them off. When he first hit the boy, when Damian first hit the first boy, did they have their clothes on then?
A49 Yes
DET R Alright, when did they take their clothes off?
A50 Right after they beat up all three of them, beat them up real bad
DET R Beat them up real bad, and then they took their clothes off?
A51 Yes
DET R And then they tied them
A52 Then they tied them up, tied their hands up, they started screwing them and stuff, cutting them and stuff, and I saw it and turned around and looked, and then I took off running, I went home, then they called me and asked me, how come I didn't stay, I told them, I just couldn't.
DET R Just couldn't stay
A53 I couldn't stand it to see what they were doing to them.
DET R okay, now when this is going on, when this is taking place, you saw somebody with a knife., who had a knife?
A54 Jason
DET R Jason had a knife, what did he cut with the knife. What did you see him cut or who did you see him cut?
A55 I saw him cut one of the little boys
DET R Alright, where did he cut him at?
A56 He was cutting him in the face.
DET R Cutting him in the face. Alright, another boy was cut I understand., where was he cut at?
A57 At the bottom
DET R On his bottom? Was he faced down and he was cutting on him, or
A58 He was
DET G Now you're talking about bottom, do you mean right here?
A59 Yes
DET G In his groin area?
A60 Yes
DET G Okay
DET R Do you know what his penis is?
A61 Yeah, that's where he was cut at.
DET R That's where he was cut.
DET G Which boy was that?
A62 That one right there.

DET G You're talking about the Byers boy again?
A63 Yes
DET G Okay
DET R Are you sure that he was the one that was cut?
A64 That's the one that I seen them cutting on.
DET R Alright, you know what a penis is?
A65 Yeah
DET R Alright, is that where he was cutting?
A66 That's where I seen them going down at, and he was on his back. I seen them going down right there real close to his penis and stuff and I saw some blood and that's when I took off.
DET G Was uh, where you all close to the creek at that point?
A67 Yes sir
DET G Where was the little boy actually at?
A68 He was close
DET R Alright, now you know where the bayou is?
A69 Right
DET R Alright, and you know where the little Creek is that goes out to the express way, and it doesn't have a lot of water in it, but it's got some water in it, and it's flowing through the, which side of that creek were you on, where you on the Memphis side of the creek or the Blue Beacon side of the creek?
A70 Blue Beacon.
DET R On the Blue Beacon
A71 Yes
DET R So, there is like a tall bank, where were you at on that bank?
A72 I was up there standing up there on the top.
DET R Alright, where were they at?
A73 They were at the bottom.
DET R On which side?
A74 Memphis side
DET R They were on the Memphis side.
A75 I was on
DET R Alright, we're going to correct that even further, that's the east side, Memphis side is the east side and you were standing at the top of the bank on the west side, were you looking down at what was going on?
A76 I was looking down, and after I seen all of that, I took off
DET R Okay, and when you left, did you hear any more hollering or anything?
A77 No
Det R Alright, you went home and about what time was it that all of this took place?
A78 About
DET R I'm not saying when they called you. I'm saying what time was it that you were actually there in the park?
A79 About 12
DET R About noon?
A80 Yes
DET R Okay, was it after school had let out?

A81 I didn't go to school
DET R These little boys
A82 They skipped school
DET R They skipped school?
A83 They were going to catch their bus and stuff, and they were on their bikes and so,
DET R Alright, they were on their bikes, where were the bikes at?
A84 They laid their bikes down when they come out to the, When they hollered for them to come out there
DET R Where did they lay their bikes down at, that's what I'm asking you?
A85 I don't know where they laid their bikes down at, cause I was behind Damian and nem, they were way behind them.
DET R Okay
A86 When they hollered, when they seen them boys
DET R The little boys came on over?
A87 Yes
DET R Had Damian seen these boys before?
A88 Yes
DET R Has he done things with them before? Or had he just been watching them,
A89 He had been watching them.
DET R Has he ever had sex with them before?
A90 No, he's been watching them
DET R He's been watching them. You mentioned earlier that, One of the meetings you went to with this cult thing, they had some pictures. Describe those pictures for me.
A91 They had some houses, trees and stuff
DET R Okay, had somebody taken pictures of these boys?
A92 Yes
DET R Were they in the houses or were they in the trees when They took those pictures?
A93 They were in the houses
DET R At the houses? Did they take like one picture of one boy
A94 They were in a group
DET R All, these three
A95 There was a group of pictures of all three of them.
DET R All three of them would generally be together?
A96 Yes
DET G How many pictures did you see, altogether?
A97 I just saw one
DET G Okay, and it has these same three boys in it?
A98 Yes
DET R You're certain of that?
A99 Yes
DET G Now, did you say that the boys skipped school that day, these little boys did?
A100 Yes, they were going to catch, they were going somewhere and like I said, Damian and nem left before I did, I told them that I would meet them

there and stuff, and it was early in the morning and so, they went ahead and met me, they went on up there and then I come up later on behind them.

DET G What time did you get there?
A101 I got there about 9
DET G In the morning?
A102 Yes
DET G Wednesday morning?
A103 Yes
DET G And
DET R What time is it right now?
A104 Right now?
DET R Yeah, you don't know what time it is?
DET G Do you not wear a watch?
A105 It's at home
DET R So
A106 My dad woke me up this
DET R so, your time period may not be exactly right in what you're saying?
A107 Right
DET R It was like earlier in the day, but you don't know exactly what time, okay cause I've gotten some real confusion with the times that you're telling me, but now, this 9 o'clock in the evening call that you got, explain that to me.
A108 Well after, all of this stuff happened that night, that they done it, I went home about noon, then they called me at 9 o'clock that night, they called me.
DET R And what did they tell you on the telephone?
A109 They asked me how come I left so early and stuff, and I told them that I couldn't stay there and watch that stuff no more, so I had to do something to get out of there.
DET R okay, who called you?
A110 Jason
DET R And you mentioned that you heard some voice in the background?
A111 I heard some dingling
DET R And what else, I think you said that he made the call from his house?
A112 He made the call from his house and Damian was Hollering in the background saying, we done it, we done it, what Are going to do if somebody saw us, what are we going to do?
DET R Okay, the knives, was it one knife, two knives, was your knife there?
A113 Ugh, ugh,
DET R Now did somebody take it and used your knife, do you have a knife?
A114 I got one knife
DET R Where is it at?
A115 It's at home
DET R okay, the knife that you said Jason was using, where is it?
A116 Uh, I don't know what he done with it, cause after I Left then they, I don't know what they done with, after I left
DET R He didn't tell you that he hid it somewhere?

DET G I've got a feeling here, you're not quite telling me everything, now you know that we're recording everything, so this is very, very important to tell us the entire truth. If you were there the whole time, then tell us that you were there the whole time, don't leave anything out. This is very, very important, now just tell us the truth.

A117 I was there until they tied them up and then that's when I left, after they tied them up, I left.

DET G But, you saw them cutting on the boys,

A118 I saw them cutting on them, and then

DET G So, what else left is there, after that?

A119 They laid the knife down beside them and I saw them Tying them up and then that's when I left,

DET R Were the boys conscious or were they

A120 They were unconscious then

DET R Unconscious

A121 And after I left they done more.

DET R They done more

A122 They started screwing them again

DET R Okay, how were they screwing them when you saw them?

A123 They, Jason stuck his in one them's mouth and Damian was screwing one of them up the ass and stuff.

DET R Okay, and the one that they were cutting the penis off of, did any of them are cutting the penis or whatever was being done, did they have sex with them at all?

A124 No

DET R Did either one of them?

A125 Jason did

DET R Jason did?

A126 Jason was screwing him while Damian stuck his in his mouth

DET R Okay, how did he have sex with that one?

A127 He was holding him down like, and Jason had his legs up in the air and that little boy was kicking, saying, 'don't, no' like that.

DET R Okay, he had his legs up in the air, alright, what was To keep the little boys from running off, but just their hands are tied, what's to keep them from running off?

A128 They beat them up so bad so they can't hardly move, They had their hands tied down and he sit on them

DET R You said that they had their hands tied up, tied down, were they hands tied in a fashion that they couldn't have run, you tell me.

A129 They could run, they just had them tied, when they Knocked them down and stuff, they could move their arms and stuff, and hold them down like, wake up and raise up and the other one just put his legs up.

DET R Okay, so they had them under control, you were there the whole time that was taking place?

A130 I was there.

DET R Okay, none [notethis is not clear - it may be 'one'] of them were cut on the face real bad, is that what you said?

A131 Yes

DET R And one of them was being cut on his penis?
A132 Yes sir
DET R Alright,
DET G Did you ever use, did anyone use a stick and hit the boys with?
A133 Damian had kinda of a big old stick when he hit that first one, after he hit him with his fist and knocked him down and got him a big old stick and hit him.
DET G What did the stick look like, I mean was it like a big log like that or is it a stick?
A134 I would say it was about that big around, I would say about that long.
DET G Okay
DET R About the size of a baseball bat, maybe just a little bit bigger round?
A135 Yeah
DET R That's what you're describing with your hands, right?
A136 Right
DET R Okay, how long was the knife that Jason was using?
A137 About that long
DET R Alright, you're describing a knife that would be about 6 inches long, is that right?
A138 Yes
DET R And, what kind of blade did it have on it?
A139 Uh, like a regular knife blade
DET R Was it a knife that you fold up, or was it like a hunting knife?
A140 It was
DET R Just one piece
A141 Just a fold up knife
DET R It was a folding knife?
A142 Yes
DET R okay, uh does Damian have a knife?
A143 No
DET R He doesn't have one, he didn't have one that night?
A144 He didn't have one that night
DET R Did he borrow yours?
A145 No, he didn't borrow mine.
DET G Did they have a briefcase with them?
A146 No
DET G You didn't see a briefcase?
A147 I didn't see a briefcase, not unless they left it there at that day before it happened, unless they left it there then but I didn't see one that day.
DET G Have you ever seen them with a briefcase before?
A148 I've seen them once that night, I seen them with it that night.
DET G Okay, what is kept inside of that briefcase?
A149 They had some cocaine, and a little gun
DET G Is that when you first saw the pictures of the boys?
A150 yes, out there in Lakeshore
DET G And you saw the pictures in the briefcase?
A151 Yes, I think when we had that cult.
DET G okay, now you have participated in this cult, right?

A152 Yes
DET G How long have you been involved in it?
A153 I've been in it for about three months.
DET G Okay, what is, tell me some of the things that you all do typically in the woods, as being in this cult.
A154 We go out kill dogs and stuff and then carry girls out there.
DET G What do you all do with the girls when you're out there?
A155 We screw them and stuff
DET G Just everybody takes a turn
A156 Everybody, and we have an orgee and stuff like that.
DET G okay
DET R when you kill a dog, what do you do with that?
A157 We usually skin it, then make a barn fire and eat it and stuff
DET R okay, when you initiating somebody new come into a cult what actually is done to initiate that person into a cult?
A158 We usually you know, kill an animals, you know, you have to know how to handle the meat and stuff, after we kill it to see if he knows, if he can't handle it, then he don't get in.
DET R Okay, so he kills an animal, you mentioned earlier that he may have to eat part of that animal, what part of the animal would he eat?
A159 Uh, the meat off of his leg.
DET R The meat off of his leg.
A160 If he can't eat it, then he don't get in.
DET R Doesn't get into the cult?
A161 No
DET R Now these meetings, have they ever been violent, anybody gotten made and got into a fight?
A162 No
DET R Okay, the night you were in the woods, uh had you all been in the water?
A163 Yeah, we've been in the water, we were in it that night, playing around in it.
DET R You were playing around in the water, alright, what were you doing in the water?
A164 Just
DET R Besides just playing, the little boys, had they been in the water? Did they get into the water with you all?
A165 No, they didn't get into the water with us
DET R Okay, what were you doing in the water?
A166 We were just sitting there, throwing stuff at each other,
DET R were you all having sex?
A167 No, I wasn't
DET R You weren't?
A168 No
DET R Damian and Jason having sex?
A169 They took turns going up under the water
DET R Going up under the water, what were they doing up under the water?
A170 They were sitting so far away, they were in the water, I would say about five to ten seconds, then come up and then the other one would go down

DET R Okay, so they were just messing around in the water. They called for these boys to come over there?
A171 Yeah, they seen them boys and then they hollered, Damien said, hey, the little boys come up there.
DET G Did they call them by name?
A172 No, they just hollered at them, they slowed up.
DET G Where did the boys put their bikes?
A173 Close to right where there before you come in and they laid them down right there, and after I left I don't know what they done with the bikes.
DET G You didn't do anything to the bikes at all?
A174 No
DET G Are you sure
A175 Positive
DET G You didn't touch the bikes?
A176 I didn't touch them
DET R You've been back to this place since that murder
A177 Yes
DET R Since it (unaudible) what did you do there? Be truthful.
A178 I went down there and sit there, and after what they did to the boys, I just sit there
DET R And did what?
A179 Just thought, what happened to them real bad, just thought.
DET R Okay
A180 And I left and stuff, and walked home.
DET G When did you go back there?
A181 Two or three days after it happened, and I left.
DET R You were there by yourself?
A182 I was there by myself.
DET R Didn't you go there with some more boys once?
A183 Me. David
DET R That particular place?
A184 No, not to that place
DET R Are you willing to go down there with us and us having a camcorder and show us where these things took place? Would you do that?
Silent
DET R Wouldn't have any problem with that?
A185 Not that I know of, I wouldn't
DET R But you would be able to point out where these things took place?
A186 Yes
DET R Which way the boys came from and where you all were when he hollered for the boys and stuff like that, you wouldn't have a problem with that?
A187 After the murder and stuff, I would say about two or three days later after it happened, I went down there and thought about it and I haven't been down there since.
DET R Okay, let me ask you something, now this is real serious and I want you to be real truthful, and I want you to think about it before you answer it, don't just say yes or no, real quick. I want you to think about it. Did you

	actually hit any of these boys?
A188	No
DET G	Now, tell us the truth
A189	No
DET R	Did you actually rape any of these boys?
A190	No
DET R	Did you actually kill any of these boys?
A191	No
DET R	Did you see any of the boys actually killed?
A192	Yes
DET R	Okay, which one did you see killed?
A193	That one right there.
DET G	Now, you're pointing to the Byers boy again?
A194	Yes
DET R	How was he actually killed?
A195	He choked him real bad and all
DET R	Choking him? Okay, what was he choking him with?
A196	His hands, like a stick, he had a bit old stick, kinda holding it over his neck.
DET R	okay, so he was choking him to the point where he actually went unconscious, so at that point, you felt like he was dead?
A197	Yeah
DET R	Okay, did any of the other two boys, were you there when they were actually killed?
A198	I don't know
DET R	You say that you got sick, so that's what you were saying, did you throw up or anything?
A199	Yes
DET R	Where did you throw up at?
A200	I got a little bit ways out of there and got half a mile up the road, is when I threw up, and couldn't hardly run and I just threw up.
DET R	When you left from there, did you leave running?
A201	Yes
DET R	Were you hiding?
A202	No, I didn't hide.
DET G	Did you have some blood on your clothes?
A203	I didn't have no blood, I didn't get close to them
DET G	Were your clothes wet still?
A204	Yes, they were damp
DET G	Muddy
DET R	Alright, Insp. Gitchell touched on a point, real close, now what clothes were Jason wearing that day? That night?
A205	He was wearing some blue jeans and boots, army boots like,
DET R	Army boots? And what kind of a shirt, you know everybody wears a special shirt with different things
A206	He was wearing a mega death shirt
DET R	A mega death
A207	Or maybe a metalica

DET R Metalica shirt, alright, was he wearing a cap, anything like that?
A208 No, he wasn't wearing anything like that
DET R Alright, Damian, what was Damian wearing.
A209 Damian had some black pants on, some boots and a black t-shirt.
DET R Was anything on his shirt?
A210 No
DET R No kind of design or anything?
A211 No, just black
DET R These blue jeans that Jason was wearing, designer jeans, or were they old jeans, wore out, holes
A212 They were wore out
DET R What did they look like?
A213 They had holes in them and the knees were cut
DET R Holes in the knees. What color is Jason's hair?
A214 Blonde
DET R Light blonde, or like a sandy reddish type blonde, do you know the difference?
A215 It's like
DET R Sandy colored blonde
A216 Sandy colored blonde
DET R okay, wearing blue jeans, he had on a metalica shirt, now this is a shirt that's got metalica across the front of it spelled out, and a man's name, or picture, is that right? You tell me.
A217 They had picture
DET R A picture of somebody
A218 Different shirts, different types of shirts have different pictures
DET R Well, which one did he have?
A219 He had that uh, like a, skull like
DET R A skull?
A220 Yeah
DET R Okay, what were you wearing that day?
A221 I was just wearing regular blue jeans, my shoes
DET R What kind of shoes were you wearing?
A222 My uh, Adidas
DET R Adidas tenns shoes?
A223 Yes
DET R What kind of shirt were you wearing?
A224 I was just wearing a regular old greasy up t-shirt.
DET R Okay, was it a designed shirt, like this bull type shirt, or was it just a plain white, old
A225 Plain white
DET R Old t-shirt, where are these shoes at now?
A226 A friend of mine, he borrowed them
DET R Who is that?
A227 Buddy Lucas
DET R Buddy Lucas?
A228 He borrowed them from me
DET R The boots that Damian had on, are they army type boots too, or what

kind of boots were they? I
A229 Close like army type, not quite
DET R Okay, they are black, is that right, they lace up?
A230 Yes
DET R Okay, and Jason's black and lace up?
A231 Jason's were black up to, about knee
DET R Oh, they come way up on him?
A232 Yes
DET R Okay, Damian's didn't come up that far?
A233 No
DET R Okay, they killed the boys, you decided to go, you went home, how long after you got home before you received the phone call? 30 minutes or an hour?
A234 Uh, silent an hour
DET R An hour after you got home, so they were there for a lot longer
A235 Yes
DET R When he called you on the phone, did he say that he had just got in?
A236 When he first called me, he said, how come you left, and said, I couldn't stand it, I had to do something else
DET R Okay, you couldn't stand it.
A237 And then Damian, I heard Damian in the background saying we done it, we done it, what we gone do if somebody saw us
DET R Did anybody see you leaving?
A238 No
DET R That you know of
A239 That I know of
DET R Did anybody see Damian and Jason?
A240 I don't know, I left before them
DET R But have you heard anybody say that they saw Damian and Jason?
A241 No
DET R You haven't heard anybody?
A242 No
DET R Okay, these initiations, you say that they eat part of the leg meat?
A243 Yeah
DET R Does that involve eating part of the penis of the animal?
A244 No
DET R Just the meat?
A245 Just the meat
DET R Okay, has Jason and Damian talked to you since this happened?
A246 No
DET R They haven't talked to you about this?
A247 They hadn't said nothing around me, when I was over to my friend's house, they didn't say nothing.
DET R When you've been by yourself, and I'm sure in the last three weeks you've been by yourself with them sometime
A248 You know Damian keeps asking me how come I left and stuff and hadn't anybody said anything to me about it.
DET R Okay, what did he say to you about it when you came to the police

	department, after seehng that boy in the woods? Up there behind the Goodyear place? What did he say about that?
A249	He didn't know anything about that.
DET R	He doesn't know that
A250	No
DET R	Okay, what about when you get with Jason by himself?
A251	He keeps on asking me what are we going to do next, I told him, I can't do nothing now cause I go to work with my daddy everyday
DET R	So, they are scared, is that right,
A252	They are scared cause after what they did, I told him that I was going to work with my daddy, I got to do something
DET R	So, what do you think ought to be done to them for killing these boys?
A253	They need to be put away for awhile,
DET R	Put away for a while. Do you think they are sick or just mean?
A254	I think they are sick
DET R	They are sick okay. Is there anything else that you want to add to this statement?
A255	No
DET R	Why did you not come forward with this information?
A256	Cause I was scared
DET R	Scared of Damian? or scared of the police?
A257	Scared of the police
DET R	Are you scared of Damian now?
A258	No
DET R	Are you scared of the police now?
A259	No
DET R	You are not, so we've treated you well?
A260	Yes
DET R	Alright, I am going to conclude this interview, the time is 3:18PM.

APPENDIX 2

Transcription of second audio-taped interrogation of Jessie Jr. taking place at approximately 5 pm, June 3rd, 1993. This second interrogation took place after a judge requested that the time of the crimes be clarified and other details be clarified before issuing a search warrant. Denotations and modifications are the same as in Appendix 1, with the letter B denoting the second confession.

DET G	Jessie, uh, when when you got with the boys and with Jason Baldwin when you three were in the woods and then little boys come up, about what time was it? When the boys come up to the woods?
B01	I would say it was about 5 or so 5 or 6.
DET G	Know, did you have your watch on at the time?
B02	Huh uh (no)
DET G	You didn't have your watch on?
B03	Huh uh (no)
DET G	Uh, alright you told me earlier around 7 or 8, which time is it?
B04	It was 7 or 8.
DET G	Are you

B05 It was starting to get dark.
DET G Ok, it
B06 I remember it was starting to get dark.
DET G Ok, well that clears it up. I didn't know, that's what I was wondering, was it getting dark or what.
B07 We got up there at 600 and the boys come up and it was starting to get dark.
DET G Ok, so you and Jason and Baldwin uh, Damien you all got there right at 6.
B08 About 6 yeah
DET G Is that a normal time that you all meet at 6?
B09 Yeah.
DET G Ok, when you do your cult stuff does 6 mean something, I mean is that a time you normally do meet?
B10 Yeah.
DET G Ok, so you all met out there at 6 and then the boys come up about what time?
B11 About 7.
DET G About 700, Ok. So you all were out there with the boys and all this stuff going on and until you noticed it starting getting dark. Is that correct?
B12 Yeah.
DET G Ok, now are you sure about that?
B13 Yes.
DET G Ok, uh, Ok, hold on just a minute. (Pause) Ok Jessie uh, I asked you about your clothing and you said that uh, what what were you wearing?
B14 I was wearing uh, blue jeans, and a white shirt with some kind of basketball deal on it. Some tennis shoes Adidas.
DET G Alright, your shirt was it a, uh, what kind of shirt was it?
B15 It was a white shirt with a basketball on around it.
DET G Is it a shirt like you got on now?
B16 Uh huh (yes).
DET G What kind of shirt is it like you have on now? That is what, a t-shirt?
B17 Uh huh (yes).
DET G Ok, so you had a white t-shirt with a basketball design on it. Ok, uh, what about shoes, what kind of shoes did you have on?
B18 White and blue Adidas.
DET G White and blue?
B19 uh huh (yes).
DET G And who has those shoes now?
B20 Buddy Lucas.
DET G And how old is Buddy?
B21 He is about 18 or 19.
DET G Why does he have your shoes?
B22 We went we was coming home one day and it was raining and he didn't have nothing else to wear so he put on one of my shoes.
DET G Ok, and where does he live at?
B23 In Lakeshore.
DET G Is there

B24 By, uh the church.
DET G Is there a street or anything?
B25 It is a street but it ain't got no names on it though.
DET G What street is the church on?
B26 On uh, as soon as you get off of Cherry Street. Uh, Cherry Street right in front of it.
DET G Off of Cherry Street?
B27 Uh hu (yes)
DET G Ok, are there any vehicles around close by that I could recognize that trailer?
B28 It should be a green truck and a brown van and there is a basketball goal right there where the green truck is at by the basketball goal.
DET G Alright, who tied the boys up?
B29 Uh, Damien.
DET G Did Damien just tie them all up or did anyone help Damien or
B30 Jason helped him.
DET G Ok, and what did they use to tie them up?
B31 A rope.
DET G Ok, what color was the rope?
B32 Brown.
DET G Did you ever see the boys in the water?
B33 Uh, yeah, down by the water.
DET G Alright, how did the boys get into the water?
B34 They pulled them there into the water.
DET G Alright, when you say they who is it that pulled them into the water?
B35 Jason and uh, Damien.
DET G Do you wear a belt?
B36 Nope.
DET G Does Jason where a belt?
B37 Unt uh (no).
DET G Does Damien wear a belt?
B38 Yeap.
DET G What kind of belt does he wear?
B39 A black leather belt with uh, beads uh, like little beads around it.
DET G With beads around it?
B40 Like little beads you know stubbies with
DET G Ok, about how thick is the belt?
B41 It's about 4 inches.
DET G Now, do you know what 4 inches looks like?
B42 About like that, the belt was about like that. (Using hands to show width)
DET G Ok, I don't think that's quite 4 inches, but uh, probably about 3 something like that.
B43 Uh huh.
DET G Which, which boys were raped?
B44 Uh, Byers and the Branch.
DET G Ok, so you know them by name and face, well enough to call them by name?
B45 Uh huh.

DET G Ok, did you, did you see the Moore boy, was he raped?
B46 No.
DET G Alright, who raped those two boys?
B47 Jason and Damien.
DET G Do you know which one raped which boy, or how did that happen?
B48 Damien raped the Myers by hisself and and Jason and Damien raped uh the Branch.
DET G Alright, give that to me again now.
B49 Damien raped uh the Myers by hisself and Jason and Damien raped uh the Branch.
DET G Did anyone have oral sex with the boys?
B50 Yes, Damien and Jason.
DET G How many of them did they do that to?
B51 Just two, Branch and Byers.
DET G How did they keep the boys quiet?
B52 Put their hands over their mouths.
DET G Did they do anything else other than put their hands over their mouths? How did they finally keep them from being quiet, cause the boys bound to have been hollering?
B53 They stuck their hands over their mouths first, and then they stuck their shirts to their mouth.
DET G Ok, did they do anything else to them to make them be quiet?
B54 They stuck their thang in their mouth.
DET G Ok, did they, were they hitting them before that or afterwards?
B55 Before and after, just trying to keep them off of them.
DET G Just all of the time?
B56 Just trying to keep Jason and Damien off of them.
DET G Now they put their, whose shirts did they put in their mouth?
B57 Damiens.
DET G Ok, alright hold on just a minute, -pause- Let me askyou something else, Jessie, I'm sorry, I keep coming back and forth, but I got people that want me to ask you some other questions, uh talking about oral sex, did you see, you know we had talked earlier about how Jason and uh Damien do each other, have sex with each other did they, did they have oral sex on the boys?
B58 Yeah, they, they, one of them stuck their thang in one of the boys mouth while the other one got the other one up the butt and stuff.
DET G Ok, but did, did anyone go down on the boys and maybe suck theirs or something?
B59 Not that, I didn't see nothing neither one of them do that.
DET G You didn't see that?
B60 Uh, uh
DET G Ok, did, did they pinch their penis in anyway or were rough with it or anything like that?
B61 I didn't see nothing like that, not rough with them, I just seen um
DET G You didn't see anyone go down on the boys?
B62 Uh, uh.
DET G Are you sure?

B63 Yeah.
DET G Ok. Pause Gave Jessie a Coke That Coke was kind of cold huh?
B64 Uh huh.
DET G I tell ya it tasted pretty good to me though. Um, Jessie when, now the boys hands were tied up right?
B65 Right.
DET G How did, how did, they force these boys to have oral sex on them? How did they have a hold of them?
B66 One of them had holding them by the arms while the other one got behind them and stuff.
DET G Did he ever hold him up here or
B67 Uh, the one that was holding him up there at the front grabbing him by his headlock.
DET G Had him in a headlock? Did he have him any other way?
B68 He was holding him like this by his head like this and stuff (Notewas indicating the victims being held by their ears)
DET G Could he have been holding him up here like that?
B69 I was too far away he was holding him up here by his head like this (Noteshowed the same as above)
DET G So, so
B70 And he was pulling him.
DET G Ok, so who was one of them doing that or both of them was doing it? Was Jason?
B71 Jason was holding him while Damien did it and then they took turns.
DET G So, they both did it to all three of these boys?
B72 Just them two as far as I know.
DET G Just the two of them?
B73 Yeah.
DET G But they, they both Jason and Damien did it to two of the boys and they took turns?
B74 Uh huh.
DET G And they would hold, tell me again about their hands on, I mean I know you're, you're holding it up here.
B75 It was up here by their heads and stuff and was just pulling and stuff.
DET G Alright, so they are up here, had their hands
B76 By their ears and pulling them and stuff.
DET G Alright, Ok, say, say that again for me now.
B77 Hold them by their head, by ears and pulling
DET G Ok.